PRE-CONVENTION ISSUE

May, 1946

THE FOUNDRY

wherever metals are cast...

TECHNOLOGY

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DETROIT

Tuning up.... FOR PEACE

● Five years ago the men and women of this country turned aside from the ways of peace, to those of war. They did it with sad, but resolute and determined hearts. Through their labors and sacrifices they have made a notable contribution to victory.

Their purpose achieved, they now turn back gladly,—and with the same resolution, to the ways of peace. In their will,—their ambitions, and their skills,—in the new products,—the new inventions, and the new manufacturing techniques,—from all these there is much promise for "the tomorrow".

Industry is tuning up now,—getting ready. This takes time. But, out of the babel of discord, there will soon come harmony, pitched and keyed to the fulfillment of the ambitions and plans that will make this an even greater nation.

On our drafting boards are plans for the modernization, mechanization and revitalization of many foundries. Through the use of Bartlett-Snow sand conditioning, mold, and castings handling equipment, both the quality and quantity of the output in these plants will be increased. Costs will go down. Their products will find readier sale. The workmen will get larger take home pay, easier—like their jobs better—thus reducing absenteeism and turnover—resulting in smoother, more continuous, and more profitable operation.

THE C. O. BARTLETT & SNOW CO.

6201 HARVARD AVENUE • CLEVELAND 5, OHIO

ENGINEERING REPRESENTATIVES IN THE PRINCIPAL CITIES

FOUNDRY SAND, MOLD AND CASTINGS HANDLING

MANUFACTURER'S ASSOCIATION, INC. FOUNDRY EQUIPMENT

99% pure fused soda ash molded into 2-lb. pigs, PURITE is easy-to-use and effective in action. Pigs are simply added to ladle or cupola by count. No weighing or measuring. No loss or dust. PURITE is safe and economical to use.

SHIPPED IN 100-LB. BAGS AND BULK CARLOADS

IMPROVE STRENGTH and MACHINABILITY OF CASTINGS

For better cupola operations with hotter metal and less oxidation of the iron and metalloids in the charge, use Purite. This scientific flux removes impurities and prevents segregation defects. In both cupola and ladle, Purite increases the fluidity and pouring qualities of the molten metal, speeding production of sounder castings.

Ask your foundry supply house for a copy of Mathieson Bulletin P-41, "Refining and Desulphurizing Cupola Iron with Purite."

PURITE

99% PURE FUSED SODA ASH

THE SCIENTIFIC FLUX FOR BETTER MELTING & CLEANER IRON

Mathieson
CHEMICALS

THE MATHIESON ALKALI WORKS (INC.)
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FOUNDRY LOADS ARE LOADS FOR *Purple Strand*

How much tonnage do you handle in a day?
How many flasks, ladles, castings?
Whether you use a giant traveling crane or a few small hoists, your lifting and moving depend heavily on wire rope.
When it's Bethlehem Purple Strand, you have a rope that's completely dependable, strong as only premium steel can be, tough and long-lasting.
Purple Strand is Bethlehem's best. No matter what size or construction you need, you'll find it a trustworthy rope. There is none better for heavy foundry loads.

When you think WIRE ROPE . . . think BETHLEHEM

FEDERAL GREEN BOND

A 100% MINERAL SAND BOND OF PROVEN, PRACTICAL QUALITY, USED IN ALL CLASSES OF FOUNDRY SAND IN GREY IRON, MALLEABLE AND STEEL FOUNDRY PRACTICE

Best of the Bentonites

When men first began to make shapes in sand with the object of pouring molten metal into it, they recognized the value of controlling sand strength. GREEN BOND gives sand any desired strength. It may be mixed to make a durable mold, or to produce an easily collapsing sand that runs freely. GREEN BOND is a uniform mix. Its qualities are the same in a handful, a shovelful or a carload.

SOMETHING TO INTEREST YOU... SEE US AT THE SHOW... BOOTH 812

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THE FOUNDRY

for MAY 1946

VOLUME 74 NUMBER 5

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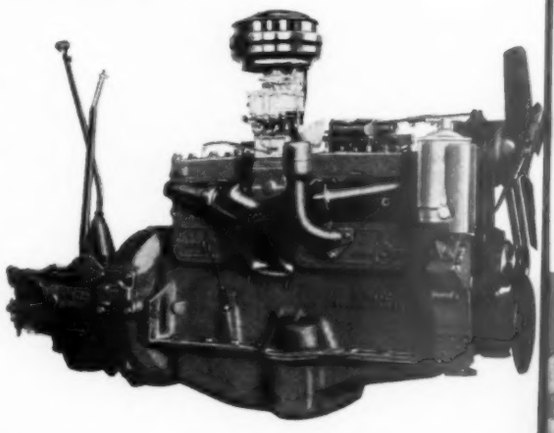
Welcome to the Linoil Booth 613 & 621

North Exhibition Hall

Right in the middle of things.

Make the Linoil Booth your Field Headquarters



One of the plants visiting foundrymen in Cleveland always want to see is The Allyne-Ryan Foundry Co., on East 91 St. Here with modern equipment and modern practice 1250 tons of high grade castings is a normal month's output. The White Super Power cylinder block core and the one for Mack truck on the other page are typical examples of the kind of work made. All cores are made with Linoil, and all cores used by Allyne-Ryan in the last 30 years have been made with Linoil. "You can say just anything you want to over my signature about Linoil—it is good without any qualification," says Mike Sweeney, Treasurer. Jim Bezacinsky, who is putting the calipers on the White jacket, is superintendent of the core department and he is ready to tell the world about the rightness of the oil he is using.

THE WERNER CO.

(DIVISION OF ARCHER-

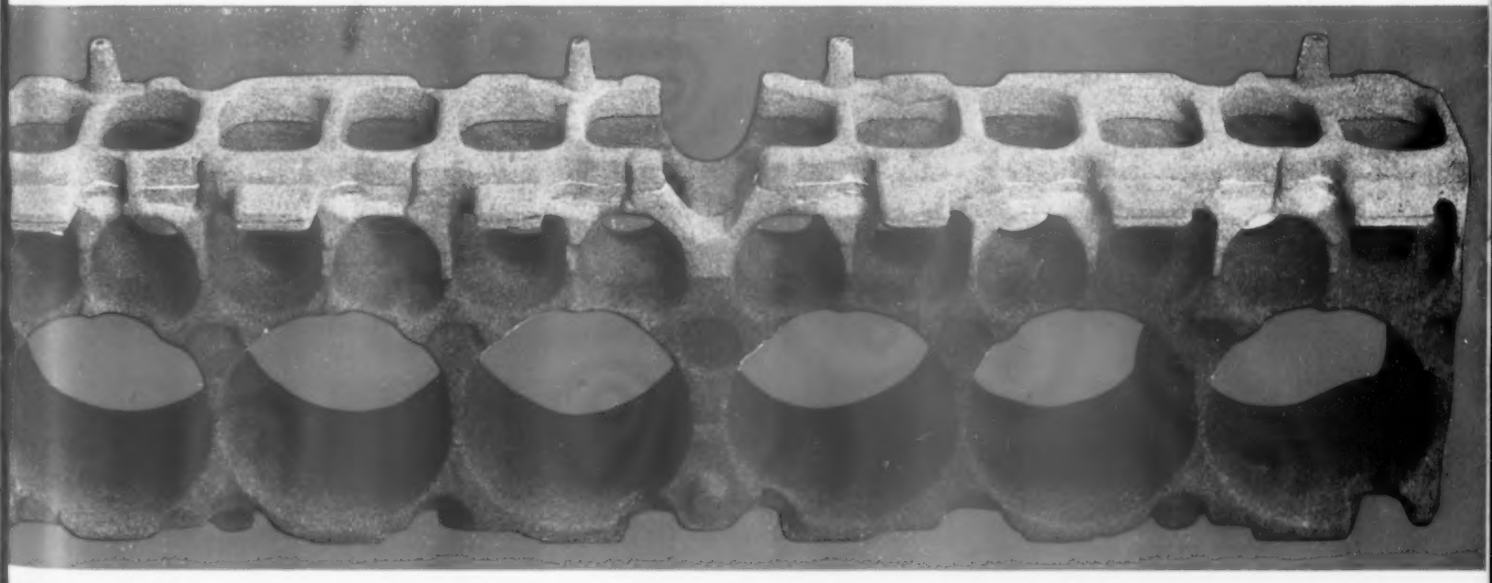
2191 WEST 110 STREET WOODBINE

TO CLEVELAND

Help celebrate the Golden Jubilee of the A.F.A. at the biggest, grandest, most stupendous Convention and Exhibition of all time. A post graduate and refresher course for every foundryman. Learn what the rest of the world is doing and see the latest developments in equipment and practice.

LINOIL

High binding ratio, perfect behavior on core bench and in blowers, fast drying, drying to centers evenly, collapsibility for cooling contraction, quick shakeout, fine appearance—all that, you get in Linoil.

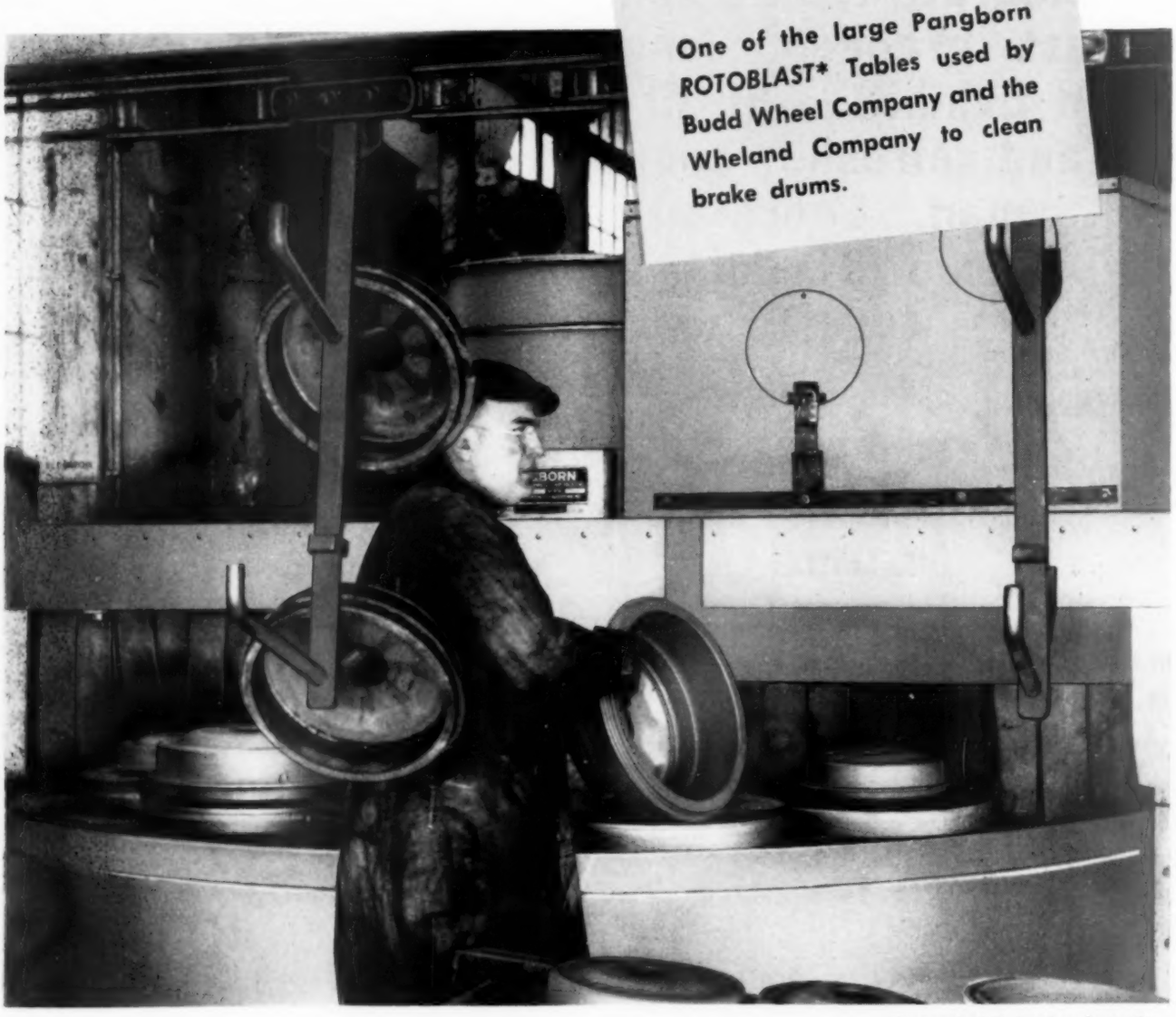


SMITH COMPANY

DANIELS - MIDLAND COMPANY)

4690 CLEVELAND 2, OHIO

Metal Cleans



One of the large Pangborn ROTOBLAST* Tables used by Budd Wheel Company and the Wheland Company to clean brake drums.

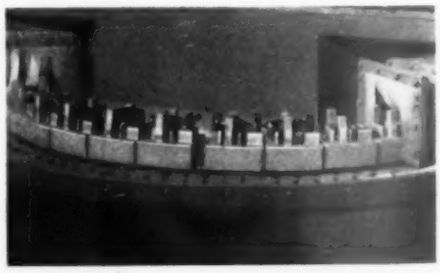
*Trademark of the Pangborn Corporation.

Do fatigue failures start internally? No—say many metallurgists. They believe that failures due to fatigue usually start with a surface fracture which widens, under stresses, to cause early fatigue failure. Therefore, any treatment of metal designed to increase fatigue resistance on the surface adds greatly to its service life.

Many producers of metal parts have adopted "shot peening" as a method of eliminating the source of surface fractures, particularly on parts subject to repeated cyclic stress up to a value near its yield point. Shot peening equipment developed by Pangborn has succeeded in increasing fatigue life in some cases up to 1000%.

Shot peening has increased the flexing life of leaf springs, for example, by four to ten times.

Pangborn engineers have developed a successful universal ROTOBLAST Peening Table. Your individual problems can be worked out by specially developed work-carrying fixtures to insure proper handling of the work through the peening field. Write Pangborn Corporation, Hagerstown, Maryland.



ROTOBLAST Table set-up for shot peening of rocker arms to increase fatigue resistance.

Metal Faster

ROTOBLAST* Cleans Metal at Less Cost

900 to 1000 passenger car brake drums per hour . . . and a proportionate number of truck brake drums per hour . . . that's the rate at which *The Wheland Company, Chattanooga, Tenn.* will blast clean brake drums using Pangborn Twin ROTOBLAST Auxiliary Spindle Tables.

Budd Wheel Company which has used Pangborn ROTOBLAST Tables for a number of years to clean brake drums, recently ordered additional ROTOBLAST Tables and when they are installed will have a total of ten tables.

These two cases are typical of the world-famous companies using the ROTOBLAST method of airless blast cleaning, which saves time, saves breakage, improves quality and uniformity, facilitates inspection and machining.

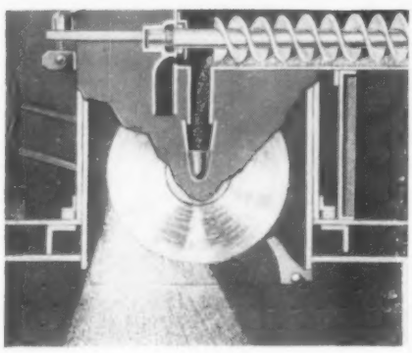
*Trademark of the Pangborn Corporation.

ROTOBLAST Tables—with 45° Wheel — Shorten Time Further

More thorough, more uniform cleaning on table-type machines, such as Budd Wheel Co. and The Wheland Company use, results from the exclusive Pangborn design which directs the blast stream on the work at a 45° angle. Vertical as well as horizontal surfaces get cleaned at the same time—making it often unnecessary to turn the work for second and third passes.

Other features of ROTOBLAST Tables include variable table speed, large work openings, rim drive, non-clogging sweeps.

Complete information on ROTOBLAST equipment is available by addressing Pangborn Corporation, Hagerstown, Maryland, *world's largest manufacturer of blast cleaning and dust control equipment.*



"COME TO PANGBORN" See Our Large Display of ROTOBLAST Equipment in operation at the Golden Jubilee Foundry Show, May 6-10, Cleveland, Ohio

Pangborn

PANGBORN CORPORATION, HAGERSTOWN, MARYLAND

No Other Nozzle Will Out-Perform a Pangborn-Norbide†

Made with a Norbide boron carbide liner—the most abrasive resisting substance ever made for commercial use. Consistently out-performs its guarantee — 1,500 hours with metal abrasive, 750 hours with sand.

Pangborn Corporation, Hagerstown, Maryland.

†Trademark of Norton Co. for Boron Carbide.

Latest Information on Economical Blast Cleaning
Pangborn Corporation, Hagerstown, Maryland

Gentlemen: Please send me free bulletin checked:
ROTOBLAST Barrels, No. 213 ☐ ROTOBLAST Special Machines, No. 2120 ☐ ROTOBLAST Tables, No. 211 ☐ Air Blast Rooms, No. 400 ☐

Name..... Title.....

Company.....

Address.....

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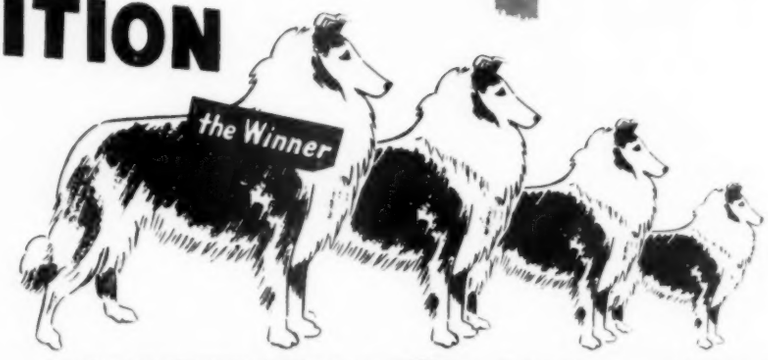
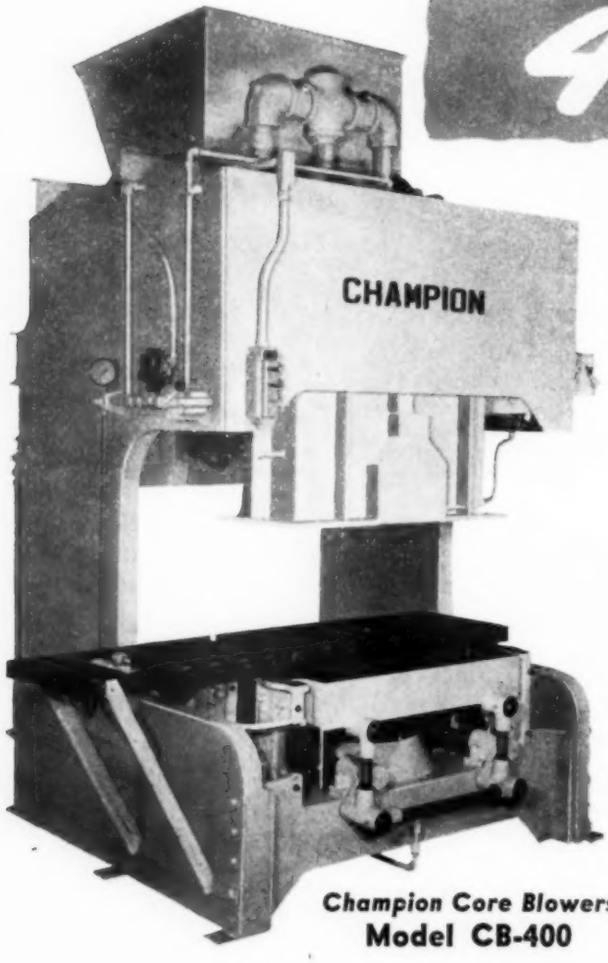
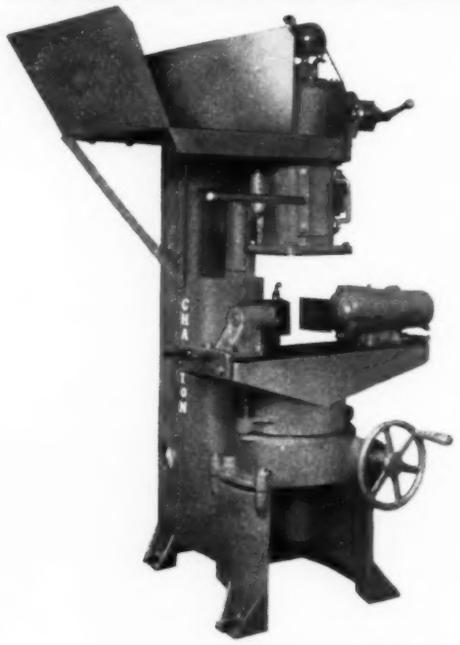
WILL MEAN
KEENER COMPETITION



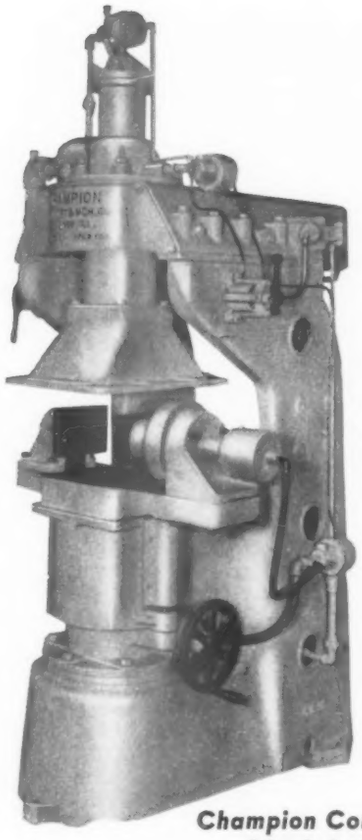
4 GREAT
ARE READY TO



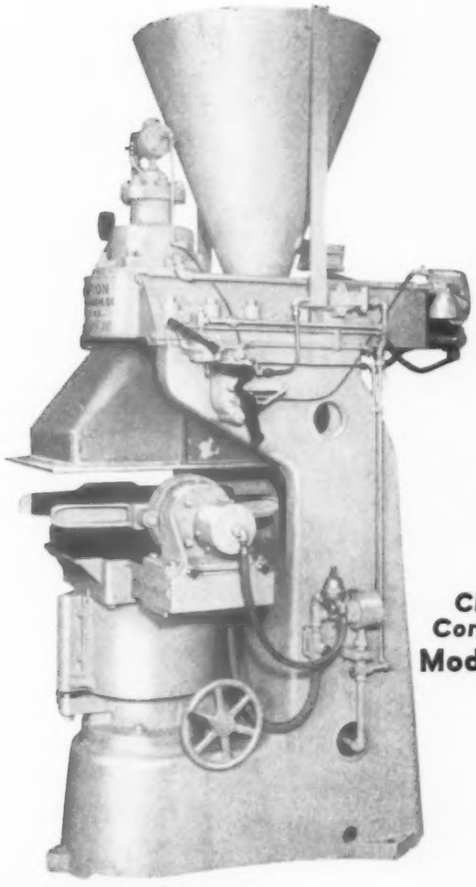
Champion Core Blowers
Model CB-400



Champion Core Blowers
Model CB-10



Champion Core Blowers
Model CB-12



Champion
Core Blowers
Model CB-15

CHAMPIONS
MEET THE CHALLENGE

These four great *Champions* are True-Blue Ribbon winners—*Champions* every inch and every pound of them, backed by almost a half century of foundry "know-how." That's why we at *Champion* can guarantee complete satisfaction from every installation. Each model has been tried and proved in many of the world's leading foundries, small and large.

By simply setting the box and pulling the lever, any person without previous experience can produce perfectly rammed cores on a *Champion*. A single valve operates the core box clamp, clamps same against the blow plate, blows the core, exhausts and releases the clamp in the proper cycle. Regardless of size or design —small or large, simple or complex cores —the ramming time is identical.

When keener competition comes, stay with the winner, who'll still be *Champion*.

CHAMPION
FOUNDRY & MACHINE CO.

1318 WEST 21st STREET CHICAGO 8, ILLINOIS

BETTER FOUNDRY EQUIPMENT

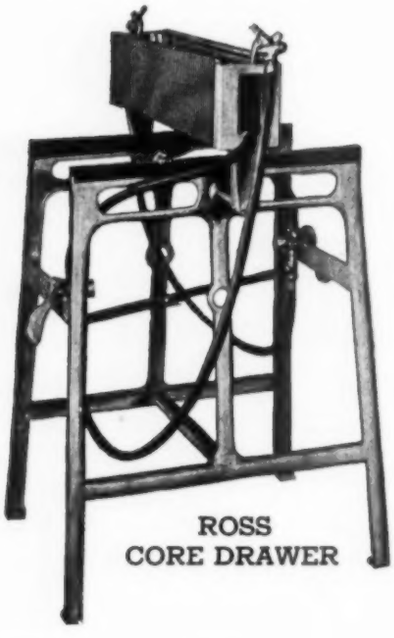
See in Booth 1120 Foundry Show

GAST CORE AND MOLD SPRAYER

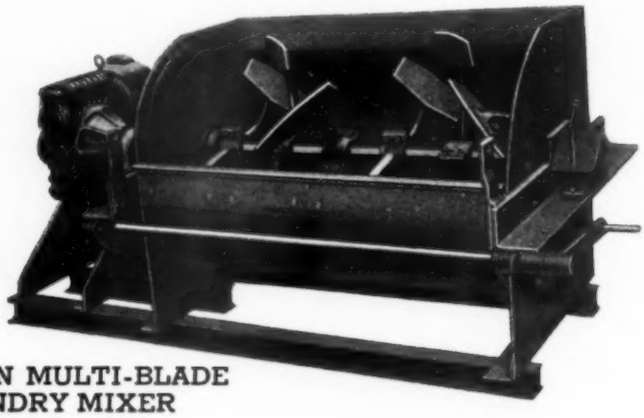
Gast Core and Mold Sprayer—A low pressure, large jet atomizing sprayer, equipped with air motor to drive paddle agitator. For applying any type of wash to either green or dry sand molds or cores. It is regularly used with silica, naphtha or gasoline, talc and synthetic washes as well as the graphite or coke base materials. Wash is kept in suspension by paddle agitator at all times.

Ross Core Drawer—If you are faced with a manpower problem, remember that skilled labor is not required to draw cores on this machine and the most difficult boxes can be drawn as fast as the easy ones. Many core boxes require no rigging at all. The Ross Core Drawer makes cores come true to size.

Freeman Multi-Blade Foundry Mixer—Here is a mixer which has everything built-in as standard equipment and includes many features not available as accessories on other mixers. Send for booklet which explains how differently this mixer is built and just what you may expect of its operation in your plant. Note greater number of blades.



ROSS CORE DRAWER



FREEMAN MULTI-BLADE FOUNDRY MIXER

The Freeman Supply Company

Pattern Shop & Foundry Supplies & Equipment

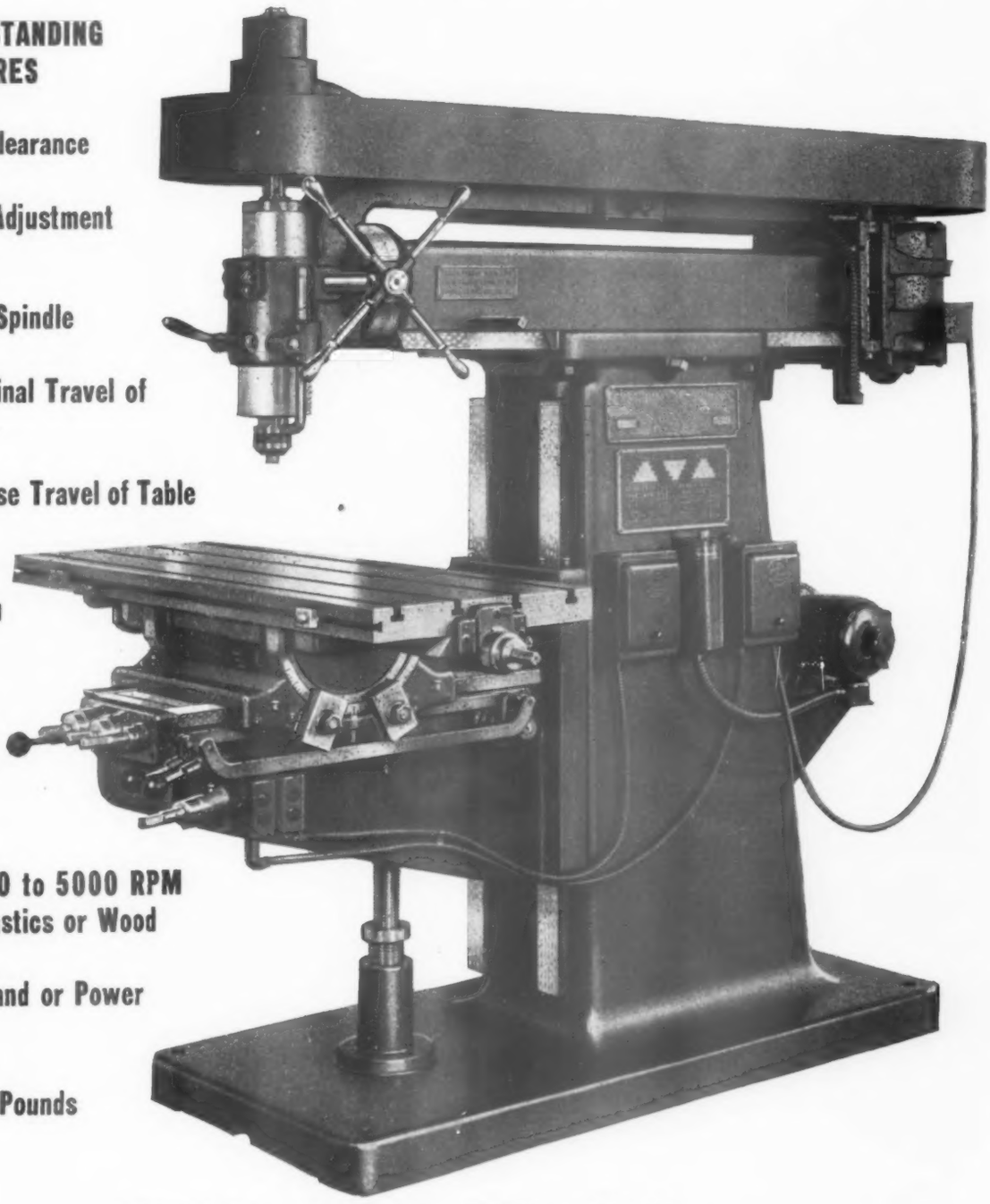
Mahogany and Pine Pattern Lumber

1152 East Broadway **TOLEDO 5, OHIO** **Taylor 4624**

BETTER PATTERN SHOP EQUIPMENT

MANY OUTSTANDING FEATURES

- 32" Throat Clearance
- 24" Vertical Adjustment of Table
- 8" Travel of Spindle
- 30" Longitudinal Travel of Table
- 16" Transverse Travel of Table
- 90° Tilting Spindle in Both Directions
- 30° Tilting Table in Both Directions
- 12 Speeds 160 to 5000 RPM For Metal, Plastics or Wood
- Available in Hand or Power Feed Table
- Weight 5000 Pounds



540 Universal Pattern Milling Machine

The Freeman Supply Company

Pattern Shop & Foundry Supplies & Equipment

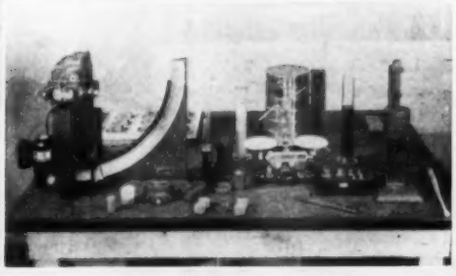
Mahogany and Pine Pattern Lumber

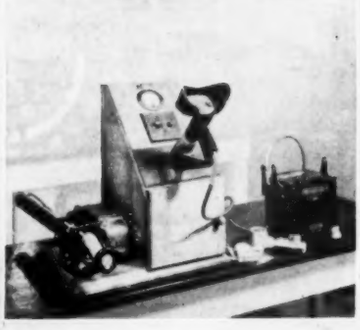
1152 East Broadway **TOLEDO 5, OHIO** **Taylor 4624**

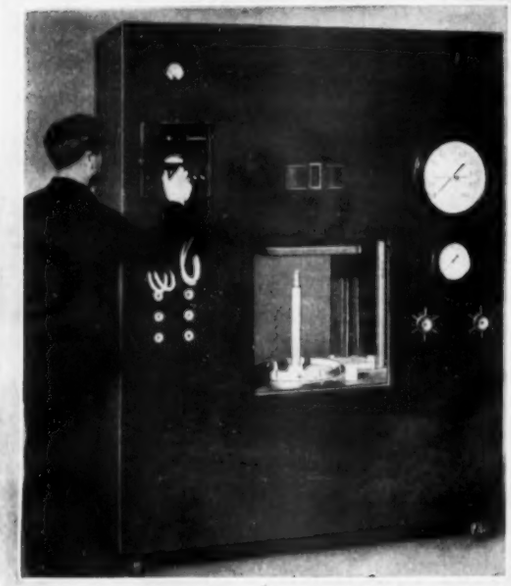
TO MORE SCIENTIFICALLY SERVE THE FOUNDRY INDUSTRY

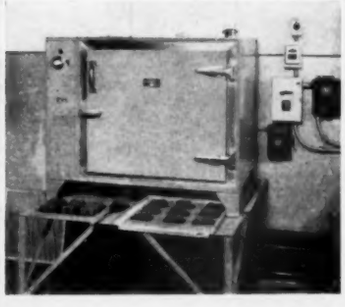
The Most Completely Equipped Laboratory Devoted Exclusively to Research and Development of Foundry Products

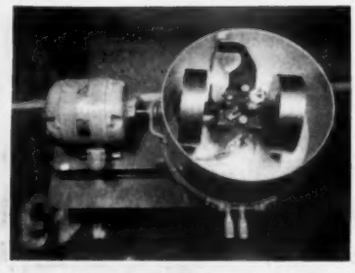
A section of DELTA'S foundry products research laboratory shown below contains such essential laboratory facilities as: Core Testing and Tensile Machines; Most Modern, Most Scientific type of Dilatometer; Specially Designed Core Baking Oven with delicate temperature adjustment and control; Sintering Machine, Sand Muller and all other necessary physical and chemical testing and analytical equipment.











Scientific Labo

of DE

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Extensive laboratory facilities are d
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DELTA Foundry Products. Modern s
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every requirement of a complete
equipped foundry laboratory.
play a vital part in a continuing pr
gram of product development a
standardization.

Every foundry product conceived a
developed in DELTA Research Labo
atories is first tested and passed
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mitted for use and final approval
actual foundry practice before it
identified with the name "DELTA

Every step in the manufacture of DEL
Foundry Products is supervised
skilled technicians of the DELTA che
ical staff. All physical, mechanical a
scientific factors are coordinated
safeguard quality and insure absolu
uniformity in the finished product.

DEL

VISIT OUR BOOTH NO. 311

tory Control Insures Uniform High Quality

LTA FOUNDRY PRODUCTS

DELTA CORE & MOLD WASHES

BASE MATERIAL

Mix with silica flour and water to produce finished base.

FOR STEEL
STEELKOAT
SPECIAL CORE & MOLD WASH

FOR GREY IRON AND MALLEABLE
GRAKOAT – BLACKOAT

FOR ALUMINUM
GRAKOAT A-1

FOR NON-FERROUS METALS
NON-FERRUSKOAT

FOR ALL SAND CAST METALS
THERMOKOAT – It's Plasti-Lastic

VISIT OUR BOOTH NO. 311 AT THE CONVENTION

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LIQUID PARTING
CORE ROD DIP OILS
CORE OILS AND BINDERS
SPRAY BINDERS
NO-VEIN COMPOUND
MUDDING AND PATCHING COMPOUND
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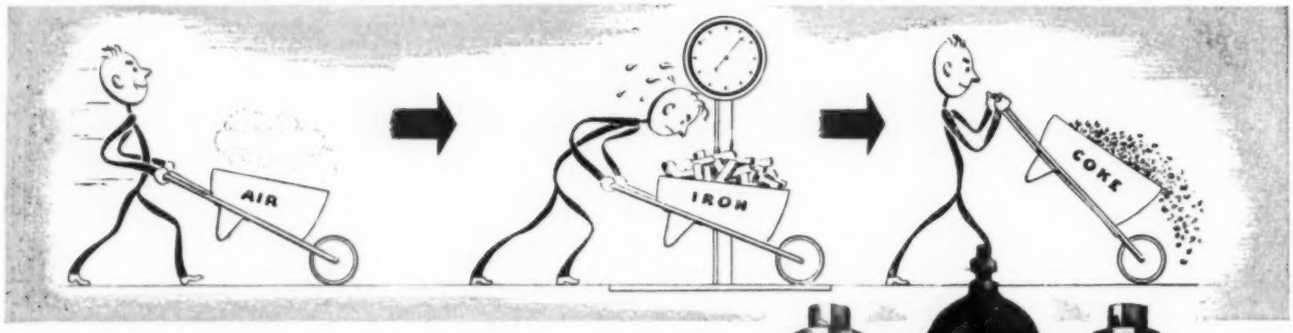
TURERS OF INDUSTRIAL & AUTOMOTIVE OILS, GREASES AND COMPOUNDS

MILWAUKEE 9, WISCONSIN



Uniformly better pours . . .

WHEN YOU WEIGH AIR TOO

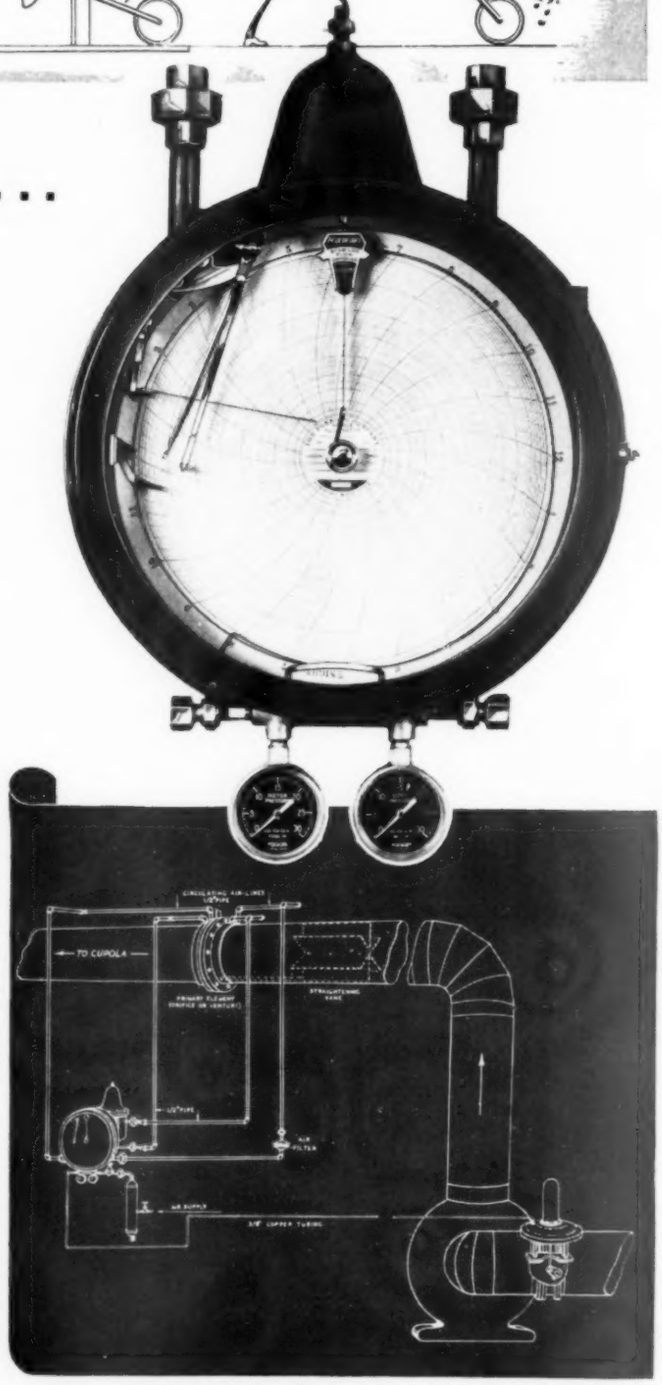
The air blown into your cupola is as important a part of the charge as the iron or coke. If you measure it *by weight* then you avoid the variations in cupola temperatures caused by changes in barometer, air blast temperature, or wind-box pressure.

BETTER PRODUCTION . . . AND MORE OF IT

Foxboro Air-Weight Controllers automatically control the air blast by weight instead of volume . . . maintaining uniform melting conditions week-in and week-out. Daily pours are uniformly hotter without burning. Pigging can be entirely eliminated. Every pour gives flawless quality castings from the first tap to the last.

The Foxboro Air-Weight Controller can be installed in a few hours. It is extremely simple to operate . . . inexpensive to maintain. Improved production will pay for it in a surprisingly short time. Let us send you complete details and names of nearby users. Ask for bulletin B-268. **The Foxboro Company, 32 Neponset Ave., Foxboro, Mass., U. S. A.** Branches in principal cities.

Visit Foxboro Booth No. 828 At The Foundry Show



Foxboro Air-Weight Controller is easily adapted to either positive type blower (as in diagram above) or fan type blower.

FOXBORO REG. U. S. PAT. OFF. **AIR-WEIGHT CONTROLLERS**

VOLCLAY BENTONITE

NEWS LETTER No. 12

REPORTING NEWS AND DEVELOPMENTS IN THE FOUNDRY USE OF BENTONITE

Revised Edition! **"Foundry Sand Practice"**

80 pages

CONTENTS

Advantages of Synthetic Sands over Natural Molding Sands • Selecting the Base Sand • Density—Its Significance in Proper Sand Selection • Moisture • Western Bentonite vs. Southern Bentonite • Blending Molding Sand Bonds • Proper Mixing of Bentonite and Sand in the Foundry • Swelling of Bentonite • *Steel*—The Use of Volclay in the Steel Foundry • *Gray Iron*—The Use of Volclay in the Gray Iron Foundry • Comparison of Bonding Agents • *Malleable*—Volclay and Panther Creek Bentonite in Malleable Sands • *Cores*—Volclay and Panther Bentonite in Cores • *Non-Ferrous*—The Use of Volclay with Fine Natural Sands • Molding Sand Practice for Magnesium Foundries • Casting Defects, Causes of.

A BOOK TO HELP YOU...

- *A digested form of present day Foundry Practices*
- *Condensed for the practical man*
- *Introduction to new materials*
- *Covers Malleable-Steel-Gray Iron-Non-Ferrous*
- *Valuable Formulae*

Use this convenient request form...

Send "Foundry Sand Practice" Revised Edition

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

CUT OUT THIS FORM AND MAIL TO AMERICAN COLLOID COMPANY

AMERICAN COLLOID COMPANY

363 WEST SUPERIOR STREET • CHICAGO 10, ILLINOIS

Producers of Volclay and Panther Creek Bentonite

It's Easy...

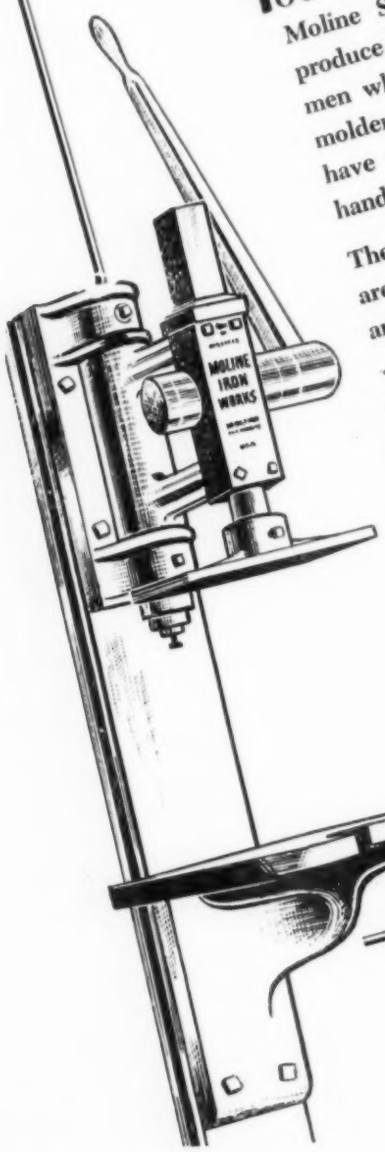
to make GOOD CASTINGS on MOLINE SQUEEZERS!

FOUNDRY men have for years recognized that Moline Squeezers can always be depended on to produce better castings easier and faster. These men who really know the Foundry business — the molders, the foremen and the superintendents — all have recognized in Moline Machines the perfect hand squeezing equipment.

There are four models of Moline Squeezers. They are made of highest quality steel, malleable iron and semi-steel castings . . . handle flasks up to 16″ x 30″ . . . have one half the number of working parts as other types . . . may be used for bench molding by swinging the head to one side . . . and have an aluminum enamel finish that makes them rust resistant and dirt and dust repellent.

Write to Factory for Prices and Complete Information

MOLINE IRON WORKS
MOLINE, ILLINOIS, U. S. A.



Illustrated here is the No. 11 Stationary Machine, especially adapted for use in malleable and grey iron, brass, steel or aluminum foundries where two or more heats are run per day and where floor space is limited.

BETTER METHODS
FOR THE FOUNDRY

Faster and more efficient methods of ramming and mulling . . . these have been the constant objectives of The Beardsley & Piper Company. The many practical achievements made, as set forth on the following pages, have led to improved, more economical foundry practice.

This painting illustrates the latest B & P development in ramming . . . a completely automatic Speedslinger, working in conjunction with a turntable and mold conveyor. The movement of the "Slinger" head is mechanically controlled, and molds of the same pattern are rammed thoroughly and with great speed.

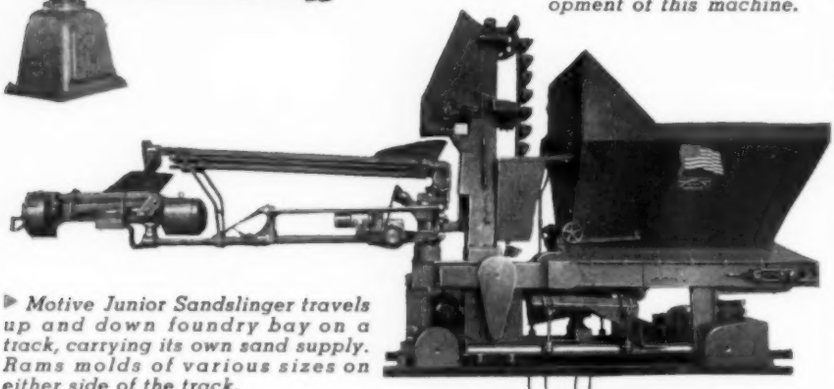
Painted from an actual foundry operation by Fred Conologhan.

THE BEARDSLEY & PIPER COMPANY • 2540 N. KEELER AVE. • CHICAGO 39, ILL.

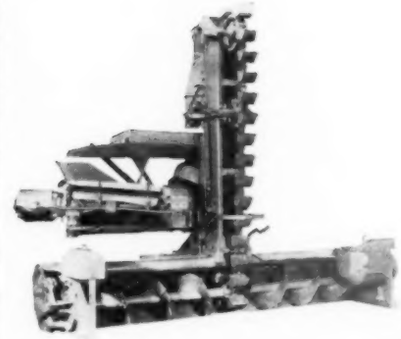
MANUFACTURERS OF SANDSLINGERS, SPEEDSLINGERS, SPEEDMULLORS, SCREENARATORS, ULBAROS, SHAKEOUTS, SAND CONDITIONING MACHINES, GYRATORY SCREENS

BETTER METHODS OF RAMMING!

◀ *Stationary Sandslinger requires but one operator. Automatic Speedslinger which operates by itself (Shown in painting on cover) is a further development of this machine.*

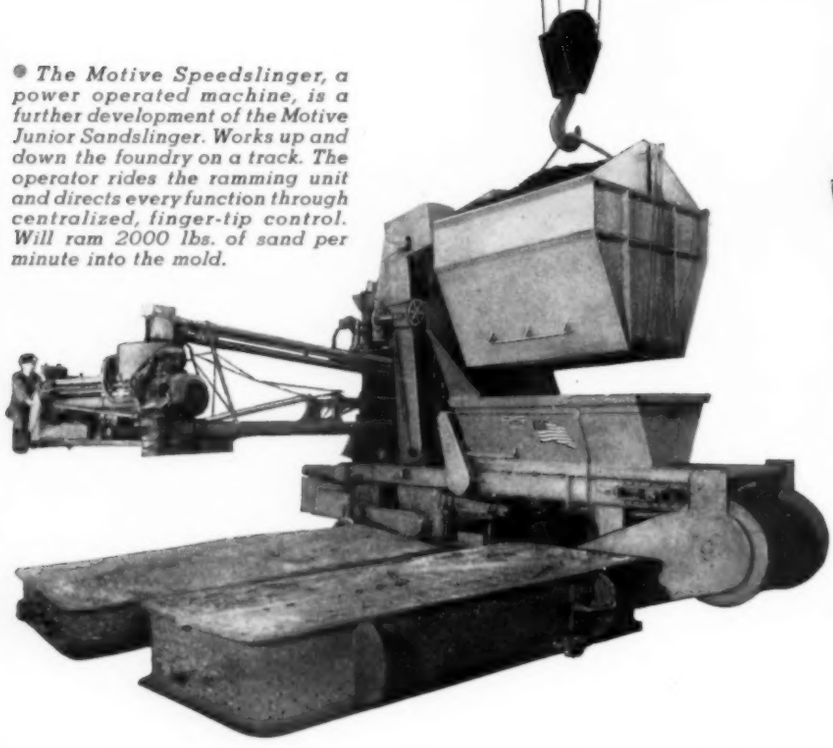


▶ *Motive Junior Sandslinger travels up and down foundry bay on a track, carrying its own sand supply. Rams molds of various sizes on either side of the track.*



● *Tractor Type Sandslinger is ideal for foundries having no auxiliary sand handling equipment. It conveys, prepares and rams its own sand.*

● *The Motive Speedslinger, a power operated machine, is a further development of the Motive Junior Sandslinger. Works up and down the foundry on a track. The operator rides the ramming unit and directs every function through centralized, finger-tip control. Will ram 2000 lbs. of sand per minute into the mold.*



● *The ramming unit or "business end" of the Sandslinger. Even inexperienced men can quickly learn to operate it.*

Sandslingers

The size of a foundry and its particular ramming requirements determine the best type of Sandslinger to use. There is a size and type of "Slinger" to meet your individual foundry needs...to do your ramming in less time, more uniformly, and at lower cost! Complete molding units—Sandslinger, turntable and sand system—can all be thoroughly planned for you by B & P engineers.

"SEE THE SLINGER"!

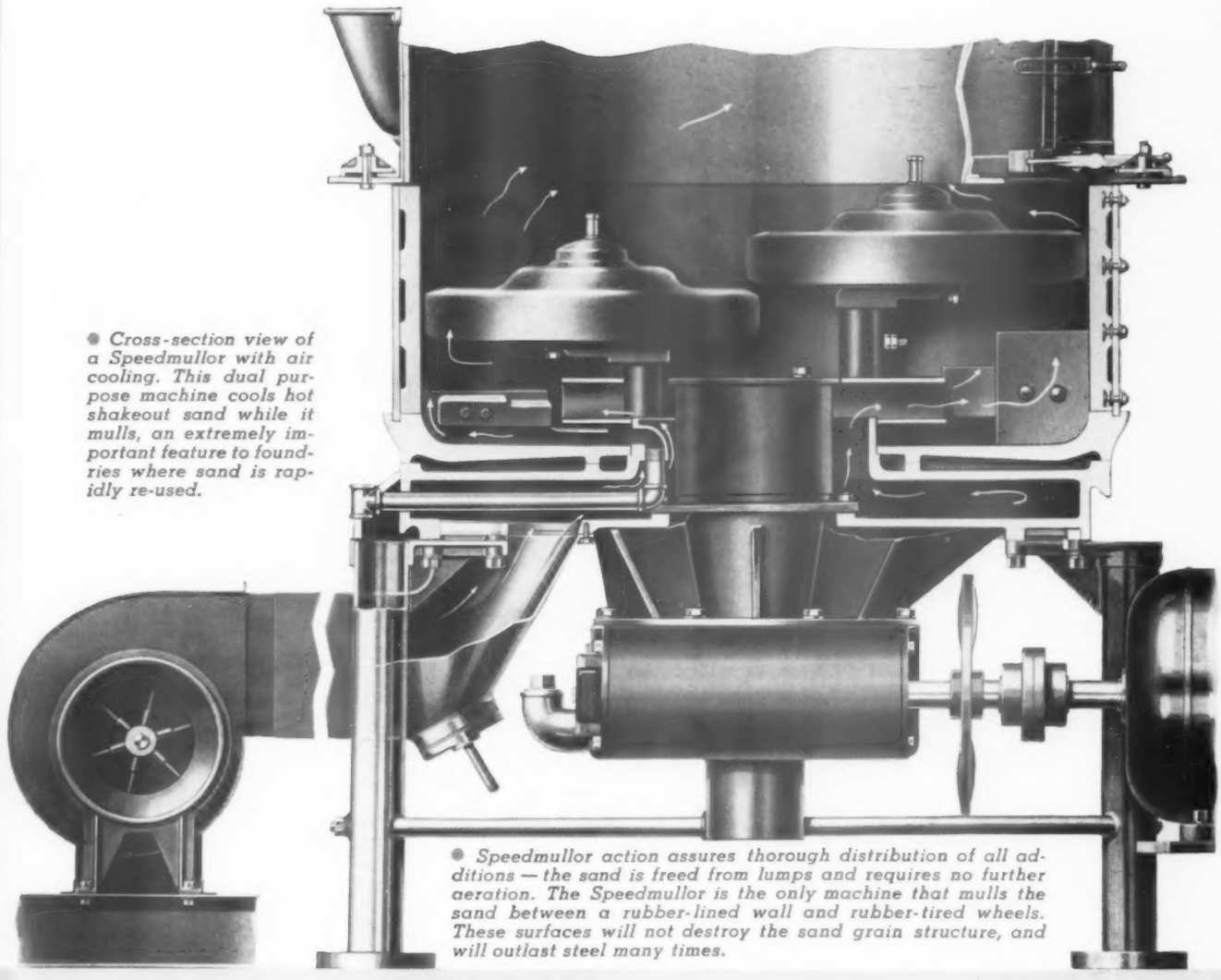
See the "Slinger" in operation! We will make arrangements for you to visit a nearby foundry and view this modern machine in action. Write today!

Ask for a Sandslinger catalog!

THE BEARDSLEY & PIPER COMPANY

2540 NORTH KEELER AVENUE • CHICAGO 39, ILLINOIS

BETTER METHODS OF MULLING!



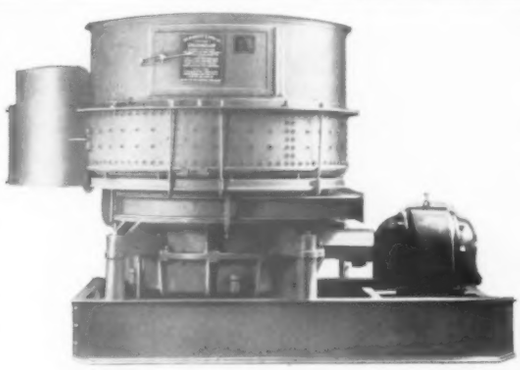
● *Cross-section view of a Speedmullor with air cooling. This dual purpose machine cools hot shakeout sand while it mulls, an extremely important feature to foundries where sand is rapidly re-used.*

● *Speedmullor action assures thorough distribution of all additions — the sand is freed from lumps and requires no further aeration. The Speedmullor is the only machine that mulls the sand between a rubber-lined wall and rubber-tired wheels. These surfaces will not destroy the sand grain structure, and will outlast steel many times.*

Speedmullors

The Speedmullor is at least 4½ times faster than any other mulling equipment! It incorporates all of the essential requirements for perfect mulling: (1) Pressure —continuous squeezing without damaging sand structure; (2) Rapid agitation—entire batch receives thorough mulling; (3) Blending—uniform distribution of bonding elements; (4) Thorough aeration.

Speedmullors assure large savings in core oils and binders and produce a sand mix which provides cleaner, smoother castings. See the Speedmullor operate in a nearby foundry! We will make complete arrangements—write today!



● *Speedmullors are offered in a variety of sizes, with or without air cooling; skiphoist; fines removal.*

Ask for a Speedmullor catalog!

THE BEARDSLEY & PIPER COMPANY

2540 NORTH KEELER AVENUE • CHICAGO 39, ILLINOIS

BETTER METHODS FOR EVERY FOUNDRY!

Mulbaros

The Mulbaro . . . small foundries use it as a versatile, all-purpose mullor...medium and large foundries find it valuable as an auxiliary mullor.

The Mulbaro is a portable mullor which provides a flexibility important to every foundry. It is comprised of two sections—top section is the mulling mechanism which lowers down onto the barrow containing sand to be mulled. As soon as one batch is mulled, another barrow can be placed under the mulling unit for immediate mulling. Thus a large variety of sands can be handled without contamination of one batch with another. Two, three or even more barrows can be used to advantage.

The prices are extremely low! Model No. 3½ Mulbaro with batch capacity of 3½ cu. ft. is only $895 F. O. B. Chicago. Model No. 7 Mulbaro with batch capacity of 7 cu. ft. is priced correspondingly low.

● *Here's how the Mulbaro operates: Sand to be mulled is shoveled into the Mulbaro's barrow—then wheeled away to the mulling mechanism which is lowered into operating position onto the barrow by means of a hoist*

● *Sand is quickly and thoroughly mulled. Plows and rubber-covered rolls squeeze, knead and aerate the sand. Upon completion of the mulling cycle, the top section is raised and barrow containing mulled sand is wheeled away.*

Screenarators

The Screenarator is the lowest cost portable sand conditioner! Ideal for small, medium and large foundries, it is fast, versatile and produces a flowable, easily rammed sand.

The Screenarator thoroughly screens the sand . . . frees it from burned cores, gaggers and other foreign matter. It cuts and breaks lumps, aerates the sand, and then aerates it for the second time when it piles the conditioned sand between benches, into boxes, hoppers, windrows, or wherever desired.

● *Operator easily moves Screenarator to desired position from floor to floor. Electrically operated, it plugs into an available power outlet.*

● *The Screenarator's height and angle of screen makes shoveling easy. Conditioned sand is discharged as far as 25 feet . . . elevated 2 to 10 feet.*

Ask for a Mulbaro and Screenarator catalog!

The BEARDSLEY & PIPER COMPANY

2540 North Keeler Avenue, Chicago 39, Illinois

Our representatives in foreign countries are: CANADA; Don Barnes Foundry Supplies & Equipment, 42 James Street S., Hamilton, Ontario • Chamberlain Engineering Ltd., 643 St. Paul Street W., Montreal, Quebec • F. B. Stevens, 2368 Dundas Street, W., Toronto 9, Ontario • Shanahan's Ltd., Foot of Campbell Avenue, Vancouver, B. C. • SOUTH AMERICA; Equipamentos Industriais Eisa Ltd., Caixo Postal 5854, Sao Paulo, Brazil • Mr. M. S. McGoldrick, Casilla 106-D, Santiago, Chile • ENGLAND; Herbert Morris Ltd., Loughborough • SWEDEN; A/B Westin & Backlund, 8 Liljeholmsvagen, Stockholm 9 • FRANCE; Fenwick Societe Anonyme, 8 Rue de Rocroy, Paris • SWITZERLAND; Fritz Steck, Foundry Engineer, Zurich • SOUTH AFRICA; D. Drury & Company, Marshall and Sauer Streets, Johannesburg • AUSTRALIA; Metters, Ltd., 154 Elizabeth Street, Sydney.

ON the 50th annual convention of the American Foundrymen's Association, the members of Aluminum Research Institute extend congratulations for outstanding achievement.

It has been a source of pride to have served your Aluminum Alloy needs with constantly improving quality Ingot . . . some of us for more than 40 of your 50 years.

In extending our good wishes to you, we ask you to accept them with the assurance that we shall continue to produce, for you, highest quality Aluminum Alloys for better castings in ever widening applications.

ALUMINUM RESEARCH INSTITUTE

111 West Washington Street, Chicago 2, Illinois

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Consider FISHER

MELTING ROOM EQUIPMENT

Foundry Proven for 40 Years

SEE FISHER EXHIBIT
Cleveland Foundry Show
MAY 6-10

Type "MNP" Furnace, Large Nose Pouring, Motor Tilting Iron or Steel Pots

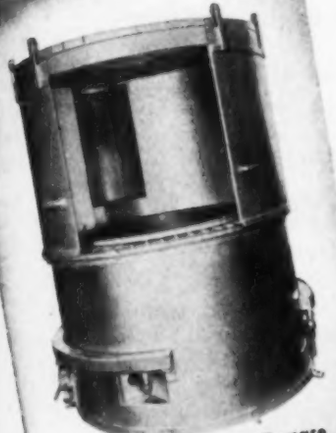
Type "HT" Oil Burner

Type "SF" Crucible Furnace Floor Mounted

Type "S" Crucible Furnace Pit Mounted

Type "SSH" Furnace For Magnesium in Steel Pots

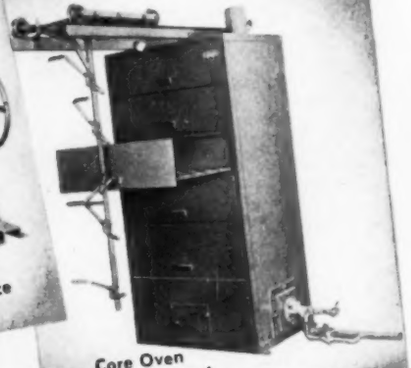
Type "ADC" Furnace For Diecasting and Permanent Mold



Type "IP"—Iron Pot Furnace To 2000 Lbs. Aluminum, 6000 Lbs. Zinc, 9000 Lbs. Lead

Ladle Heater Oil or Gas Fired

Type "BBI" Crucible Furnace Hand Tilting

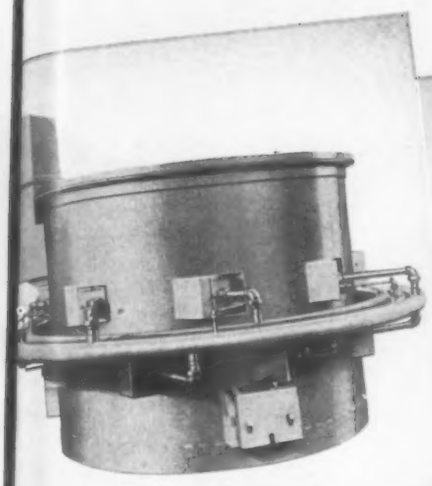


Core Oven Oil or Gas Fired

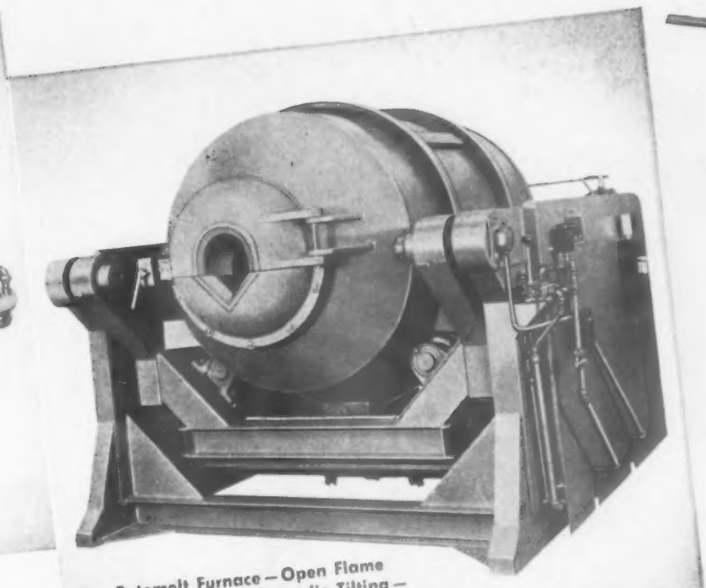
5535 NORTH WOLCOTT AVE., CHICAGO 40, ILLINOIS

Fisher FURNACE COMPANY

Engineers and Manufacturers

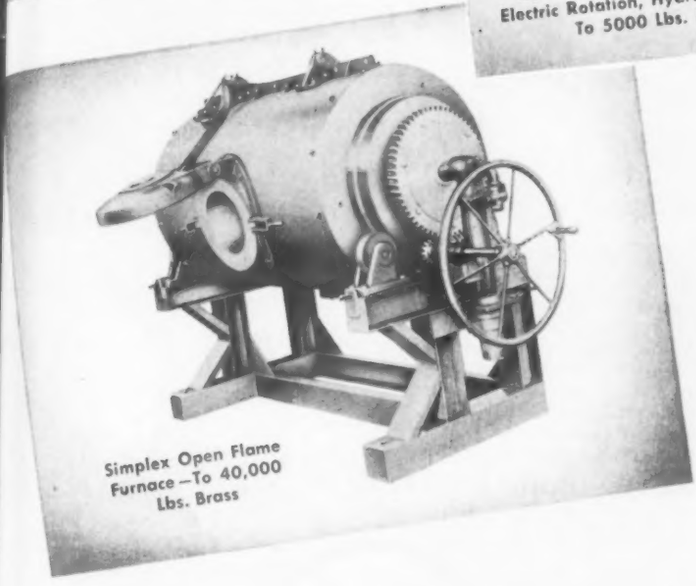


Type "MAH" Furnace
Alloying and Holding



Rotomelt Furnace—Open Flame
Electric Rotation, Hydraulic Tilting—
To 5000 Lbs. Brass

Bent-handle Crucible Tongs

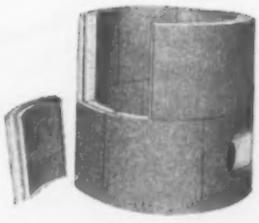


Simplex Open Flame
Furnace—To 40,000
Lbs. Brass

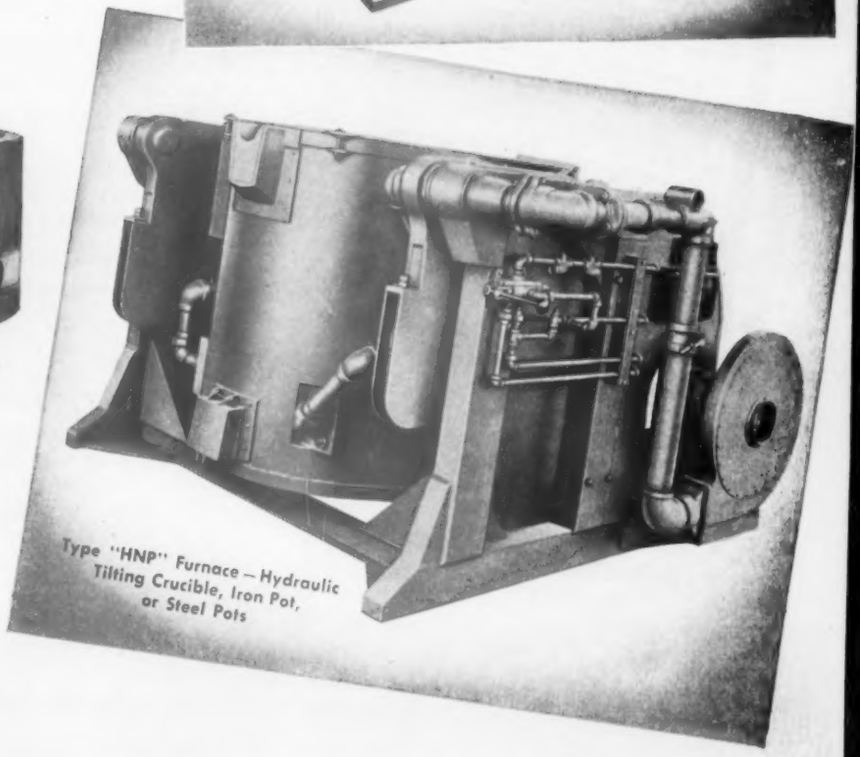
Type "MNP" Furnace—Crucible
Nose Pouring, Motor Tilting
No. 60—To No. 1000 Crucible

Pyrometers—
Indicating and
Controlling

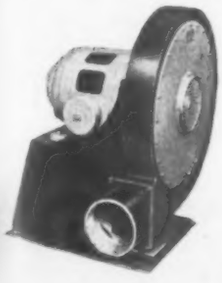
Fisher Karmix
Furnace Cement



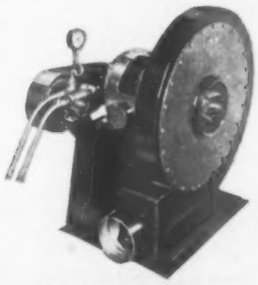
Fisher Furnace Lining
Silicon Carbide



Type "HNP" Furnace—Hydraulic
Tilting Crucible, Iron Pot,
or Steel Pots



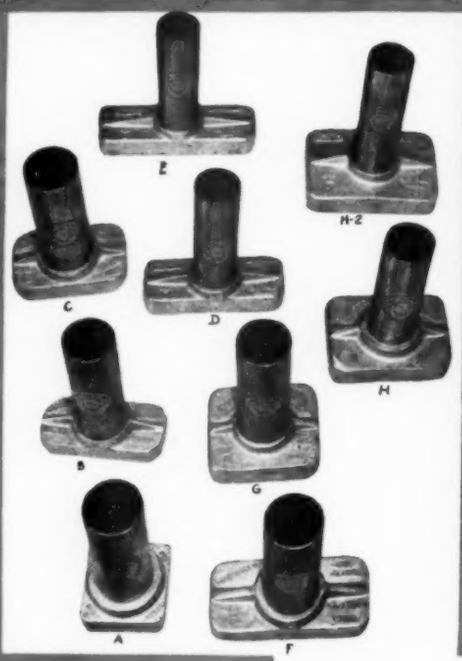
Centrifugal Blowers
All Sizes



Centrifugal Blower—Oil
Pump Combination

THE IMPROVED Redford CORE BLOWER
CARTRIDGE BENCH TYPE

FOR EFFICIENT PRODUCTION OF SMALL, INTRICATE CORES



STANDARD SAND CARTRIDGES

The Standard Sand Cartridges are a cast aluminum base into which a seamless steel tubing (2⅞" or 2¾" Dia. x 8" long) is pressed. The bottom of the base is closed with an ¼" cold rolled steel plate, in which holes are to be drilled to match the blow-holes of the core box.

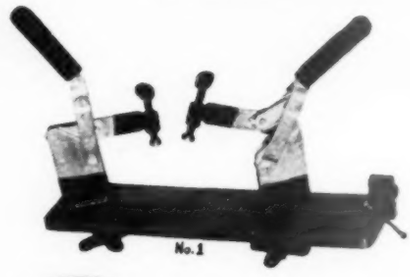
SIZES	WIDTH—LENGTH	PRICE
A	3⅜ x 3⅜	$10.00
B	2¾ x 5⅜	11.00
C*	3 x 5⅜	11.00
D	2⅛ x 7¼	12.00
E	2⅛ x 8⅝	12.00
F	3 x 7⅛	14.00
G	4⅜ x 5⅛	14.00
H	4⅜ x 8⅜	15.00
H2	4⅜ x 7⅝	15.00

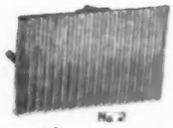
To find outside dimensions, add ¾" to width and length of inside dimension.

Special size Sand Cartridges furnished upon application.

*This size adaptable to a large range of core boxes.

1. Core Box Clamping Attachment for blowing vertically split core boxes. (On end)
2. Core Box Drawing Attachment—used with No. 1 for drawing difficult cores.
3. Vibrator and Knee Valve — air or electric furnished with No. 2.





WHAT USERS SAY

Enclosed check $295.00, which we send with pleasure. We thank you for your interest and print on this core, which was blown perfectly as per your instructions. An additional order is placed for 350 more castings and we will consider the machine paid for.

We purchased a Redford cartridge bench core blower eight months ago and in that time we have saved its cost many times in labor savings.

An experienced core maker is not necessary to operate it efficiently.

It is adaptable to all small work and easy to set up.

The relatively small commission you will make from the sale of this core blower will never free you from the necessity of working like hell to make a living. However, if everything you sell gives the same service and satisfaction that this core blower is giving us, you will inevitably obtain such freedom, but soon.

Being so pleased with our Redford Cartridge Bench Core Blower, we feel that this information should be passed along to you.

The initial investment being so small, it was no time when the blower paid for itself. Production increased tremendously and because of the wide range even short runs are being blown.

*Names of these endorsers furnished upon request

See Demonstration at Booth 1117

PRODUCES SMALL, INTRICATE CORES WITH REMARKABLE SPEED AND SIMPLICITY

Quickly and economically installed. Does not require a large volume of air—½ c.f.m. is sufficient.

A ¾ inch air line with 80 to 120 lbs. pressure is ample to make cores in single or gang boxes requiring a maximum of 2 lbs. of sand.

To blow core boxes of different height, shape or size, adjustments may be made instantly by the operator.

The Improved REDFORD Core Blower, Cartridge Bench Type, has an arm support column at the rear which provides an air reservoir to give additional volume of air per blow. Blow gun at base of column assures dry air at all times. All condensation in reservoir may be removed when using blow gun.

Sand Cartridges are made a part of the core box equipment. The base of a cartridge is determined by the blowholes in the box. However, one cartridge may be used for several core boxes of approximately the same size. The cylindrical part of the cartridge must be high enough from the base to hold sufficient sand to fill the core box once.

Write for Folder and "Seven Facts" regarding core blowing

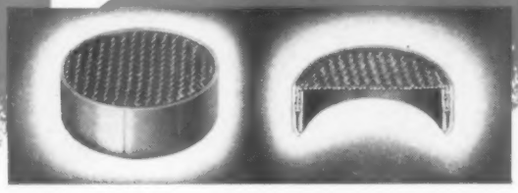
REDFORD IRON & EQUIPMENT COMPANY

PHONE: REdford 8610

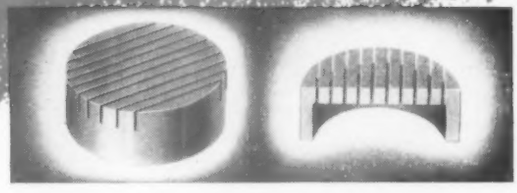
21315 WEST McNICHOLS ROAD **DETROIT 19, MICHIGAN**

High Speed Core Production

NO BLOWOUTS! WITH RIENACKER CORE VENTS



SCREEN TYPE—Patent No. 2,263,974

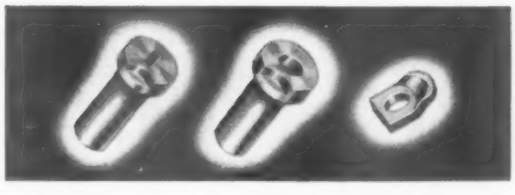


SLOTTED TYPE—Patent No. 2,238,506

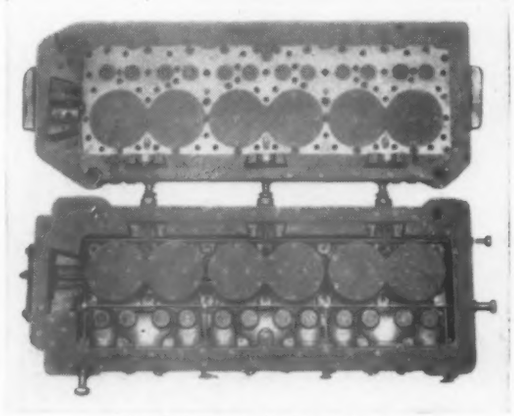
Made from 30 mesh monel screen lapped 3/16" over brass innertube and firmly secured with brass outertube, making a strong, fool-proof unit. Each vent is sized through a die assuring accurate fit. The compression between outer and inner tubes holds screen securely in place without slightest danger of blow-out. Costly work stoppages to repair or replace vents are eliminated.

Use Rienacker core vents (screen type) whenever possible—on all flat surfaces, and on curved surfaces wherever core marks are unimportant. You get fastest air escape with minimum liability of clogging.

For CONCAVE and CONVEX RADII. Made of brass, precision slotted for greatest air escape possible with this type of vent. This slotted vent is easily shaped to any curved surface; leaves no core marks on casting.



Write for information and prices on gas escape vent bushings for use with round or rectangular vent rods. Round bushings in all drill rod sizes; rectangular bushings: 3/32" × 1/4"; 3/32" × 3/8"; 1/8" × 1/4".



COURTESY OF CHRYSLER CORPORATION.

This core-box of main water jacket shows replacement of 77 Rienacker core vents (screen type), and 10 Rienacker gas escape vent bushings with both round and rectangular rods.

Order Rienacker core vents and bushings from your supplier, or direct from factory. Deliveries from stock.

RIENACKER INDUSTRIES

2035 Hilton Road, Detroit 20, Michigan

EXOTHERMIC ALLOYS

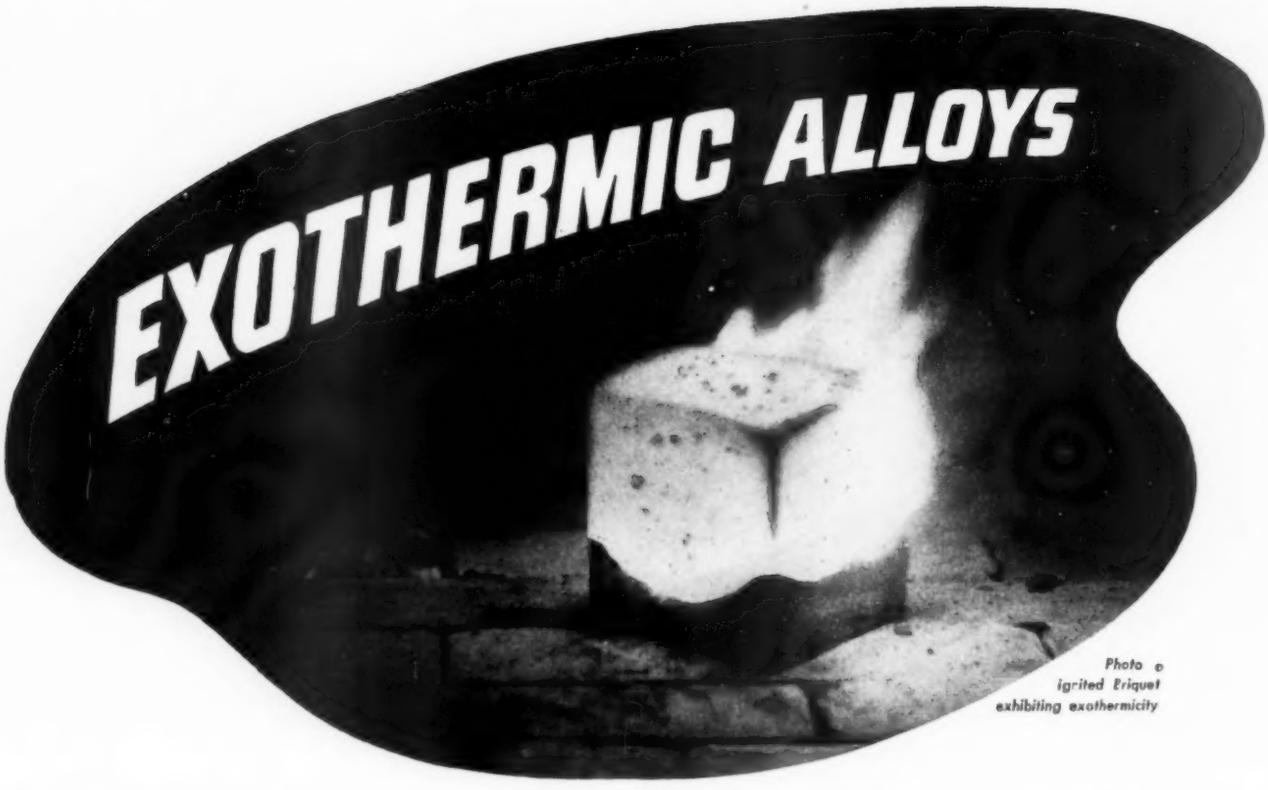


Photo of ignited Briquet exhibiting exothermicity

FOR BETTER RESULTS IN STEEL PLANT AND FOUNDRY

Other Exothermic Products of proven value to steel plant operators and foundrymen:

"SIL-X" — Exothermic Ferro-silicon —provides molten ferrosilicon at the desired spot, in furnace, cupola or ladle, resulting in cleaner metal and lower conditioning costs. Two grades: "75" and "145".

"RISER-X"—Exothermic Metal Covering—reduces shrinkage in castings and reduces piping in ingots.

HIGH CARBON "CHROM-X" — Exothermic Ferro-chromium—for furnace or ladle additions, gives higher recoveries of chromium (above 93%) and rapid, uniform distribution of chromium in steel or iron.

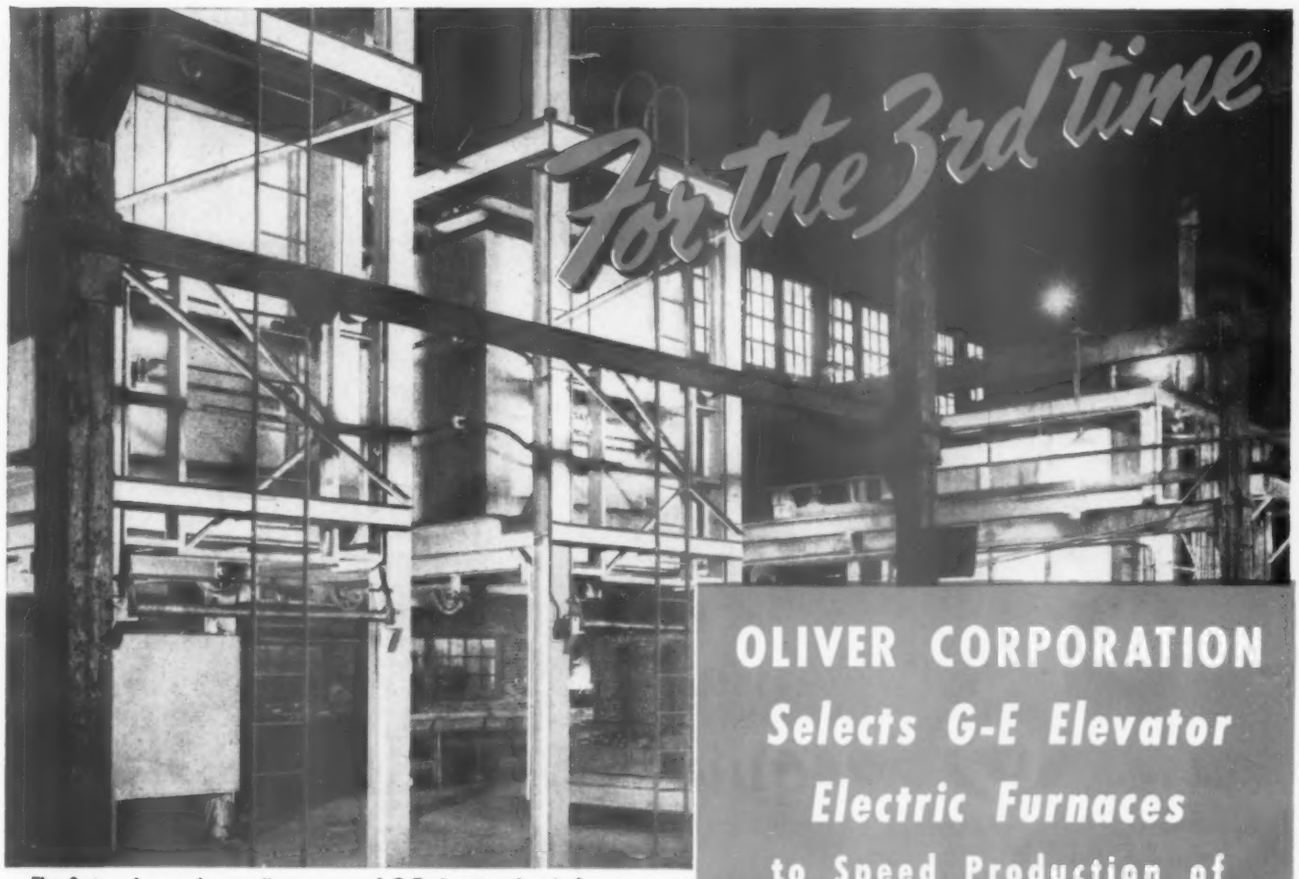
Its use results in cleaner metal, improved machinability, increased production and lower costs.

Write for Folder on the use of "Chrom-X", "Sil-X" and "Riser-X"

CHROMIUM
MINING & SMELTING CORPORATION
LIMITED
SAULT STE. MARIE ··· ONTARIO, CANADA

Service Office at
710 Ohio Merchants Trust Building,
Massillon, Ohio

Sales Agents in U. S. A. — MILLER & COMPANY, 332 South Michigan Ave., Chicago, Ill.



The first and second annealing groups of G-E elevator electric furnaces installed by the Oliver Corporation of South Bend, Indiana, are shown here prior to charging with small cast-iron parts, loaded in cast-alloy containers. The third G-E annealing group will be added this year.

OLIVER CORPORATION Selects G-E Elevator Electric Furnaces to Speed Production of Annealed Malleable Iron

A shorter annealing cycle; lower operating costs; improved quality—those were the requirements of The OLIVER Corporation when its first G-E annealing group was installed in 1939. That G-E elevator electric furnaces met *all* of these tough specifications is a matter of record. Oliver has since installed a second G-E group, in 1941, and has ordered a third this year.

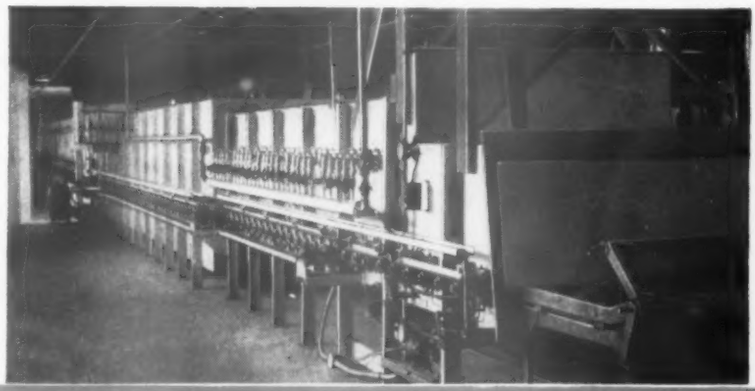
These groups, each consisting of one high-temperature and one low-temperature G-E elevator electric furnace, provide completely automatic regulation of the heating and cooling cycle by means of *program cooling control*. The installations are designed to eliminate any appreciable cooling and subsequent reheating of the high-temperature furnace, during the cycle. They permit the entire annealing process to be completed in one series of operations.

Each furnace normally loads 8000 lb. net per charge, and each group operates on an annealing cycle of 48 hours for grade A malleable iron, and a 24-hour cycle for Grade B. Loading methods vary, depending upon the charge. Small castings are loaded in lightweight, cast-alloy containers, larger ones being placed directly upon the loading platform.

For detailed information about G-E electric furnace equipment with which you can produce annealing of uniformly high quality at a reduced cycle—and with time, temperature, and cycle all automatically controlled—get in touch with our heating specialist in the nearest principal city. Or write to General Electric Company, Schenectady 5, N. Y.

G-E ROLLER-HEARTH ELECTRIC FURNACE

Where a condition in annealing production warrants a continuous furnace, a G-E roller-hearth electric furnace with automatic time and temperature control is recommended.



GENERAL ELECTRIC

IT READS LIKE A "WHO'S WHO IN AMERICA'S FOUNDRY INDUSTRY" — This partial list of firms that installed Hydro-Blast, for these simple, business-like reasons:

- *quickened production*
- *cleaner plant*
- *sizable savings*

YOU'LL HAVE, during the convention in Cleveland, an excellent opportunity to see one of several nearby Hydro-Blast installations—the ideal way to grasp what Hydro-Blast does, why it's better, how it accomplishes its important benefits. We'll gladly arrange that inspection tour—simply ask us about it, at Hydro-Blast headquarters, Auditorium Exhibit Hall, Space 414,

MAY 6 TO MAY 10

HYDRO-

2550 NORTH WESTERN AVE CH

AMERICAN MANGANESE STEEL • CRANE CO.
BLACK-CLAWSON COMPANY • ERIE FORGE
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KAUKAUNA MACHINE CORPORATION
ADVANCE FOUNDRY COMPANY
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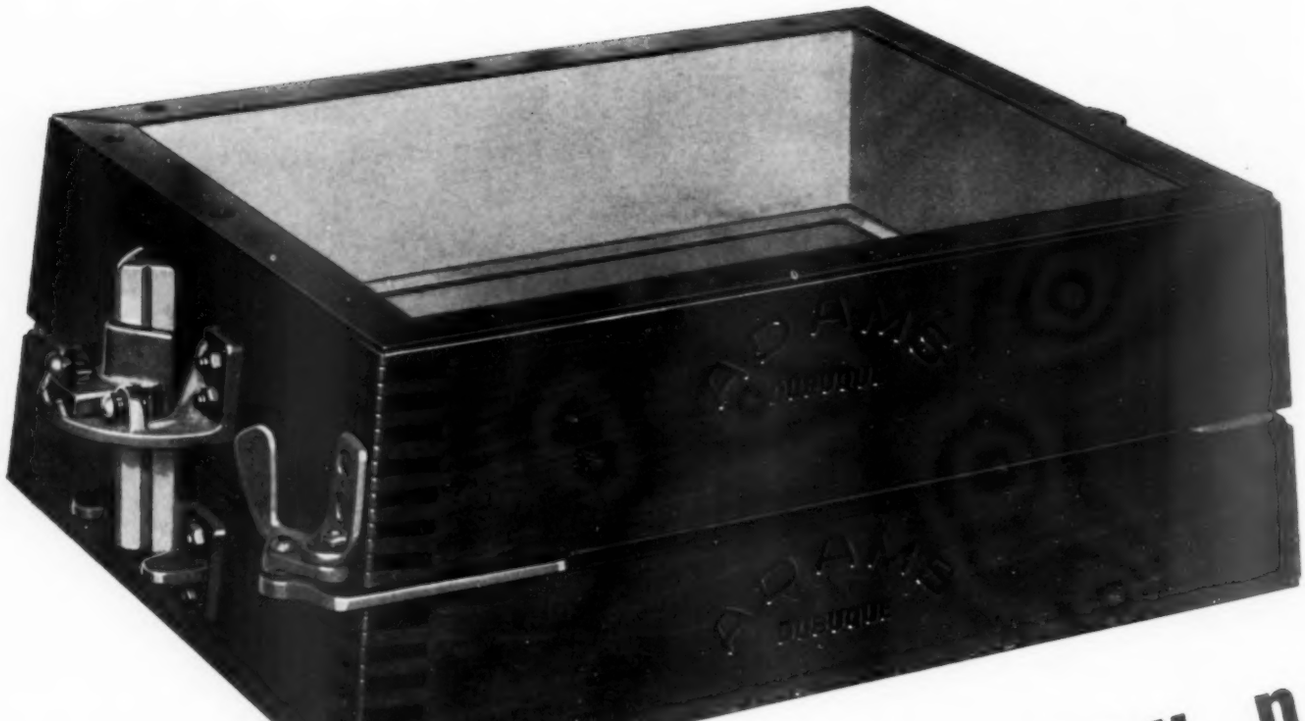
FAIRBANKS-MORSE
CHICAGO PNEUMATIC TOOL
MACHINED STEEL CASTINGS COMPANY

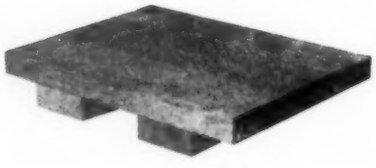
BLAST CORPORATION

CHICAGO 47, ILLINOIS

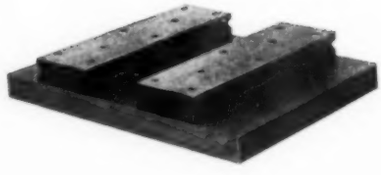


Everything you ne

PEAK PRODC



Cherry Snap Flasks
Cherry Slip Flasks
Aluminum Slip Flasks
Easy-Off Flasks
Cherry Presser Boards
Wood Bottom Boards
Steel Bottom Plates



For the
highest quality
in foundry equipment
specify "ADAMS"

THE ADAMS COMPN

MOLDING MACHINES · FLAS E

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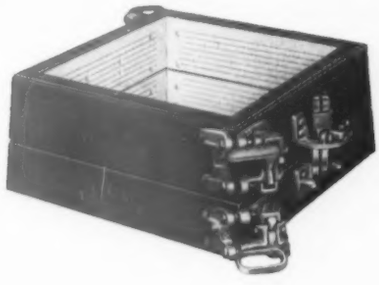

Steel Jackets
Aluminum Jackets
Cast Iron Jackets
Steel Bands
Steel Upsets
Cherry Upsets
Aluminum Upsets
Molding Machines
Vibrators
Knee Valves
Table Rappers
Tubular Sprue Cutters

Descriptive literature on any of these items gladly furnished!

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S EQUIPMENT *Established 1883*

If you are contemplating a NEW foundry or the modernization of your existing plant, we offer you our specialized experience in the design, construction and operation of modern foundries. Foundry lay-outs, production studies, special machinery and tools for efficient foundry operation—we have concentrated exclusively on the successful solution of these problems for the past quarter-century.

SPECIAL EQUIPMENT DESIGNED BY WICKLAND & CO. ENGINEERS

Heavy Duty Mold Conveyors.
Sand Conditioning Systems.
Continuous Sand Mullers.
Apron and Belt Conveyors.
Cupola Charging Machinery.
Continuous Molding.
Pouring and Shakeout Equipment.
Refuse Disposal.
Labor Saving Devices for Core-Room and Cleaning Depts.

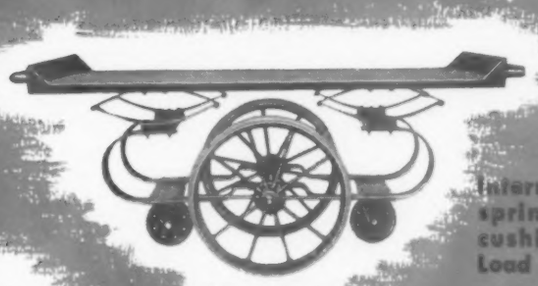
A. A. WICKLAND & CO.

Foundry Engineers

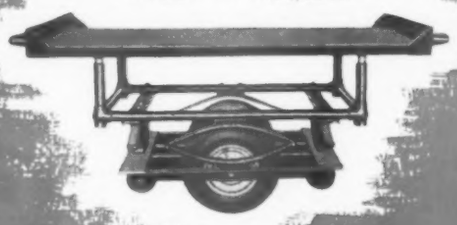
Established 1919

ENGINEERING BLDG. *CHICAGO (6), ILL.*

ACCLAIMED! APPROVED! ACCEPTED!



MODEL B-1
Intermediate elliptical springs provide extra cushioning protection. Load capacity, 700 lbs.



MODEL A-27-J
Elliptical springs and inner coil springs (in the upright supports) assure correct resiliency. Platform, 27" x 60". Load capacity, 600 lbs.

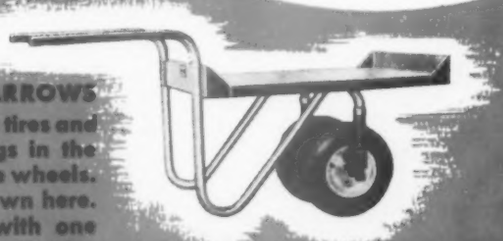
PNEUMATIC CORE TRUCKS

Since 1925 foundries have been using CMD PNEUMATIC CORE TRUCKS to speed up the handling of cores and reduce chafing and breakage. In many places costs have been reduced from 50 to 75 per cent.

Free Circular

Write Dept. 2F today for free circulars on CMD Core Trucks and other foundry specialties.

MODEL A-27
For the heaviest loads, this giant carrier is widely used. Heavy-duty elliptical springs and inner coil springs (in the upright supports) quickly absorb shocks that could chafe or break cores. Three sizes: 27" x 60", 800 lbs. capacity; 27" x 72"—1,000 lbs. capacity; and 27" x 84"—1,200 lbs. capacity.



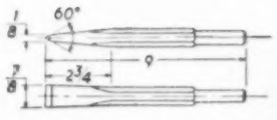
CMD CORE BARROWS
Have pneumatic tires and inner coil springs in the uprights over the wheels. MODEL C-2 shown here. MODEL C-1 (with one wheel) also available.

CHICAGO MANUFACTURING AND DISTRIBUTING CO.

1928 WEST 46th STREET CHICAGO 9, ILLINOIS

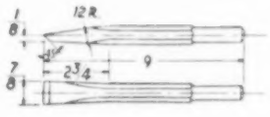
47 SIZES AND STYLES OF CLECO CHIPPERS

No. 3 WA Chipper with ratchet lock handle.

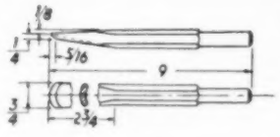


FLAT OR COLD CHISEL
Additional Lengths 12, 18, 24

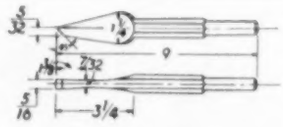
JUST A *FEW* OF THE MANY HELPFUL CHISEL DRAWINGS IN BULLETIN 75B



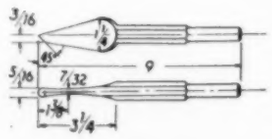
SIDE CUTTING CHISEL
Additional Lengths 12, 18, 24



GOUGE
Additional Lengths 12, 18, 24



CAPE CHISEL
Additional Lengths 12, 18, 24



ROUND NOSE CHISEL
Additional Lengths 12, 18, 24

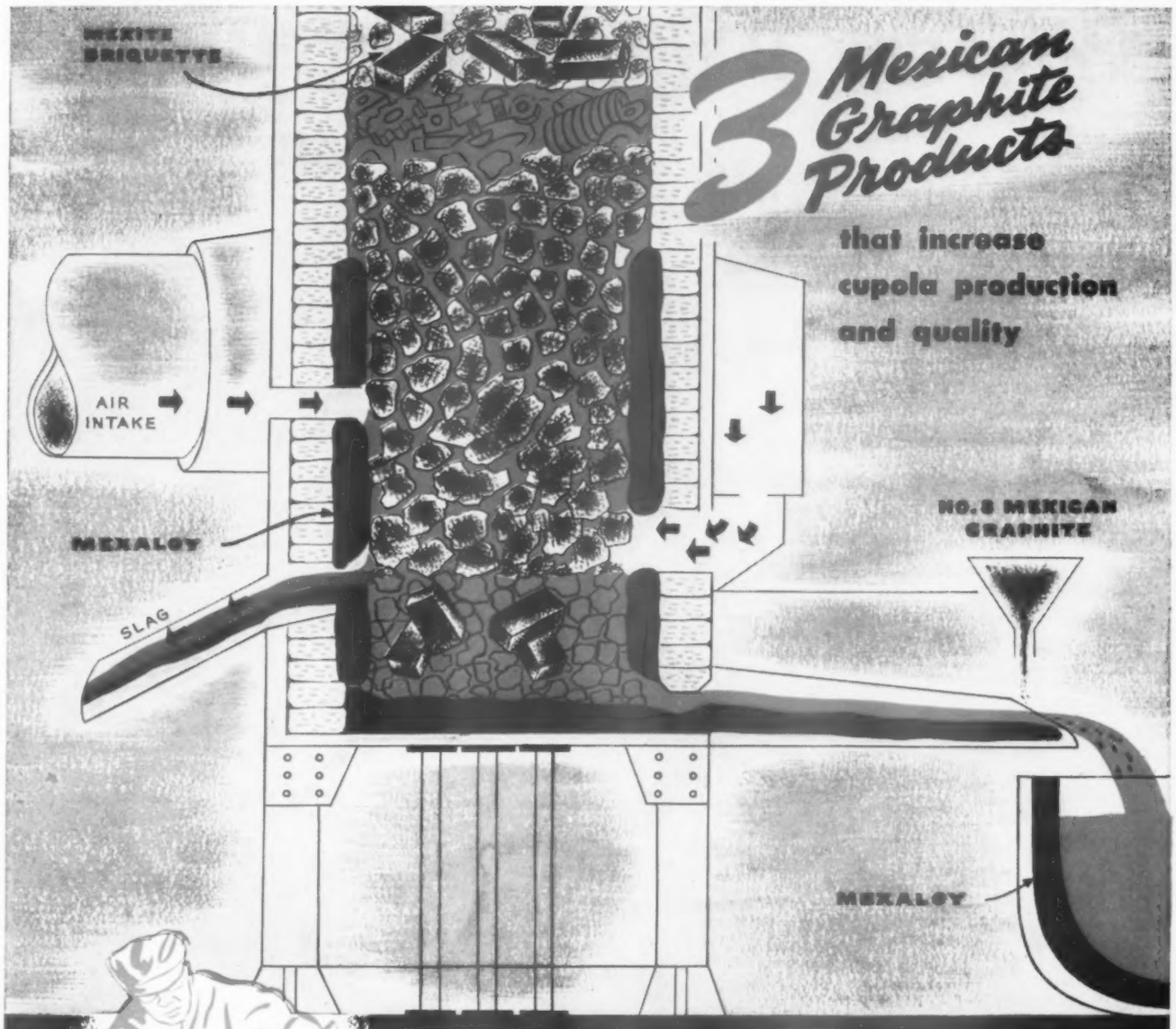
Send for Bulletin 75B, FULLY DESCRIBING THE MANY TYPES OF CLECO CHIPPERS

• In this large, varied line you will find the *exact* tool for *every* chipping, calking, beading, and scaling requirement. Either the open or closed style of handle may be had, and, for the open type, you have a choice of either a bolt or a ratchet locking device. There is also a choice of two valve mechanisms, both efficient and practically breakage-proof.

Cleco Chippers use a throttle valve that graduates the air supply, thus giving a smooth start to the piston, minimizing recoil and making the hammer easy to hold and control on the work. Furthermore, Cleco Chippers "stand the gaff" because they are extra-tough. Plungers and chisel bushings are made of hardened and tempered tool steel, ground to close limits. The cylinders are made of selected alloy steels, carefully heat treated to insure super strength.

See Cleco Tools in action at the Foundry Show Booth 1024

THE CLEVELAND PNEUMATIC TOOL COMPANY
3781 EAST 77TH STREET CLEVELAND 5, OHIO
BRANCH OFFICES IN ALL PRINCIPAL CITIES



3 Mexican Graphite Products

that increase cupola production and quality

MEXITE BRIQUETTES. One 4-lb. Mexite Briquette provides the same carbon content as 50 lbs. of pig iron when introduced into the cupola charge. Not only do Mexite briquettes sharply reduce melting costs per ton; they also reduce the range of carbon content fluctuation and give a steadier carbon analysis, a particularly vital factor when high percentages of steel are charged.

MEXALOY, applied to cupola linings, ladles, and spouts, resists molten metal and slag and keeps metal free from refractory inclusions. Its natural lubricating action provides low friction surfaces which part easily from metal and slag. A Mexaloy mixture is easily applied to any clean surface. Because it will not melt or change character under intense heat, Mexaloy gives longer refractory life with lower maintenance cost.

NO. 8 MEXICAN GRAPHITE is used for ladle additions to treat grey cast iron. Trickled into the cupola spout as metal falls into the ladle or with a direct ladle addition, it greatly reduces chill and hardness, producing castings of increased machineability. Normally only 2 lbs. of No. 8 need be added per ton of molten metal—a cost of only ten cents per ton—to assure castings which require no annealing. Write today for complete information on how Mexite Briquettes, Mexaloy, and No. 8 Mexican Graphite will give you better castings for less money.

THE UNITED STATES GRAPHITE CO. • SAGINAW, MICHIGAN

PORBECK DRAWER TYPE OVENS

GAS OR OIL FIRED WITH RECIRCULATING AIR HEATERS

UNIFORM CORES CONTINUOUSLY WITH LOW COST OPERATION

Strictly a *production* unit—note that all drawers operate independently of each other. Comes completely equipped with latest type temperature indicating controls (variable 100° to 650° F) and high efficiency recirculating air heater. Sturdy construction with 4-1/2″ fibre-glass insulation throughout. Users commend Porbeck ovens for their space and time saving features. Available in several types and sizes. We invite your inquiry.

WRITE FOR NEW CORE OVEN BULLETIN "F"

PORBECK MANUFACTURING CO.

Manufacturers since 1894 of Core Ovens, *Mold Dryers, Processing Ovens, Mold Drying Ovens, Heat Treating Ovens, and Paint Baking Ovens.*

2600 N. Ninth St. **St. Louis 6, Missouri**

SURPLUS HOBART ARC WELDERS

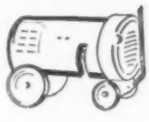
200, 300 AND 400 AMPERE RATINGS

Three million dollars worth of surplus Hobart Arc Welders *must* be sold between May 15th and June 15th. Most of this equipment is of the MG type but some quantity is available in gasoline driven units. Arrangements may be made to inspect the offered items. Largest inventories are located at Boston, Detroit, Cleveland, Chicago, Atlanta, Kansas City, Richmond and Philadelphia—but information on availability, condition and location may be obtained at any of the War Assets Administration Regional Offices listed below. The equipment will be sold on a "where is, as is" basis . . . used or unused . . . and priced accordingly. For full information contact the nearest office listed below or check and mail this coupon.

ALSO MANY OTHER TYPES OF WELDING AND FLAME CUTTING EQUIPMENT

LINCOLN
Hundreds of Lincoln Arc Welders in the popular 300-400 Ampere size are also available; some gasoline engine driven.

WESTINGHOUSE
Flexarc equipment for production or construction operations is available in smaller quantity. Also other standard makes and ratings.



RESISTANCE WELDERS
Spot Welders located in Philadelphia, Detroit, Chicago, Los Angeles, Cleveland and Kansas City; *Seam Welders* in Cleveland, Chicago, Detroit, Birmingham, Boston and Philadelphia. Also *Flash Welders.*

WELD POSITIONERS
In standard sizes and types, are located in Detroit, Boston, Chicago and New York.

FLAME CUTTERS
Save production time and money with portable or stationary, single or multiple torch flame cutting machines. All types of gas cutting equipment available for quick sale.

VETERANS OF WORLD WAR II—To help you in purchasing surplus materials, a veterans' unit has been established in each War Assets Administration Regional Office.

FREE SALE FACTS

To War Assets Administration:
Please send me information prior to your sale on the availability, condition and location of Hobart Arc Welders of the following

types:..... and ratings:.....

.....

.....

I am also interested in:—

- ☐ *LINCOLN ARC WELDERS*
- ☐ *WESTINGHOUSE ARC WELDERS*
- ☐ .....*ARC WELDERS* (other)
- ☐ *SPOT, SEAM, FLASH WELDERS*
- ☐ *WELD POSITIONERS*
- ☐ *FLAME CUTTERS*

Name.....

Firm.....

Address.....

City..... State..... 176-2

All items subject to prior sale

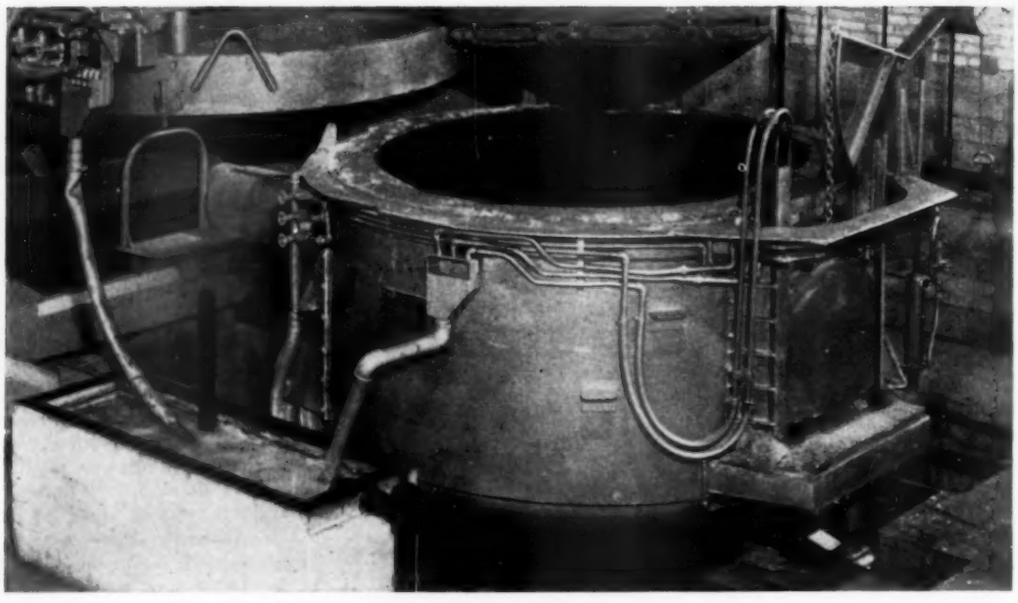
WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

IRONTON CARO-LINE

THE MONOLITHIC REFRACTORY MATERIAL FOR ACID ELECTRIC STEEL FOUNDRIES



"Ironton Caro-Line" siliceous ramming refractory mixed with grain sized ganister, is giving outstanding service in rammed acid electric furnace sidewalls. Try it in your furnaces and you will be pleasantly surprised with the results obtained.

The same mix has been used successfully for several years for rammed in bottoms, also for lining ladles handling electric steel. There is no better refractory for electric steel foundries than "Ironton Caro-Line".

We offer you the assistance of an engineer in ramming your first lining and training your men to do the job. Write to us today.

THE IRONTON FIRE BRICK COMPANY

RELIABLE REFRACTORIES

IRONTON OHIO

TRIED AND PROVEN

GLOBE SILVERY IRON

BESSEMER FERRO-SILICONS
GLOBE IRON COMPANY
THE PIONEERS OF SILVERY IRON
SPECIAL HIGH SILICON GRADES

RECENT SURVEY REVEALS 97% FAVOR

THE GLOBE PIG

Which offers these advantages to users–

UNIFORM THICKNESS—*Means uniform melting*
DENSE—*Free from kish*
LARGE MELTING SURFACE—*Means uniform melting*
LIGHT—*Easily handled–Easily racked*
DISTINCTIVE—*Easily identified*

YOU CAN'T THINK OF SILVERY IRON WITHOUT THINKING OF GLOBE

GLOBE IRON CO.

SINCE 1872 **JACKSON, OHIO**

STILL LOOKING INTO THE FUTURE

YESTERDAY—"Grinding" Set Speed Records!

To remove pads left after riser cutting, foundry men turned to grinding, the fastest method known — yesterday. But grinding couldn't cope with increased production demands.

TODAY—"Flame Scarfing" is Fifty Times Faster!

To meet this challenge, the oxyacetylene industry developed "flame scarfing" — fifty times faster than the method that broke speed records yesterday. In addition, "flame scarfing" requires no large expensive equipment . . . saves money . . . manpower.

—AND TOMORROW?

From Airco's research and development staff will come new and better methods aiding steel foundry production — continuing the progressive tradition that has characterized Airco's policy.

Airco's Technical Sales Division is at the call of steel foundry men in applying Airco processes in the solution of their problems. **A copy of an interesting booklet: "New and Improved Oxyacetylene Methods for Steel Foundries" — is available. For your copy of the booklet, and for further information concerning Airco's Technical Service write: Air Reduction, 60 E. 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas.**

AIRCO **AIR REDUCTION**

Offices in All Principal Cities

Visit our Exhibit Booths 934 and 1035 at the American Foundrymen's Convention, Cleveland, May 6th to 10th, 1946

ORIGINATORS OF MODERN OXYACETYLENE METHODS FOR STEEL FOUNDRIES

When you want uniform soundness throughout large or intricate castings, always be sure to use Republic Chateaugay Pig Iron! That's a rule which more and more cost-conscious foundrymen are adopting for their difficult pouring jobs.

From experience, these men have discovered that CHATEAUGAY fills molds completely and quickly . . . sets rapidly . . . produces quality castings, free from flaws.

They have learned, too, that CHATEAUGAY castings possess a uniformly fine grain structure and cross-section density . . . that these castings are strong and tough, with hard surfaces that resist heat, acid and wear . . . that they are surprisingly easy and economical to machine.

A Republic Pig Iron Metallurgist is ready to give you the complete story of these and other CHATEAUGAY advantages. Just let us know when you would like him to call.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

MID AMERICA EXPOSITION CLEVELAND

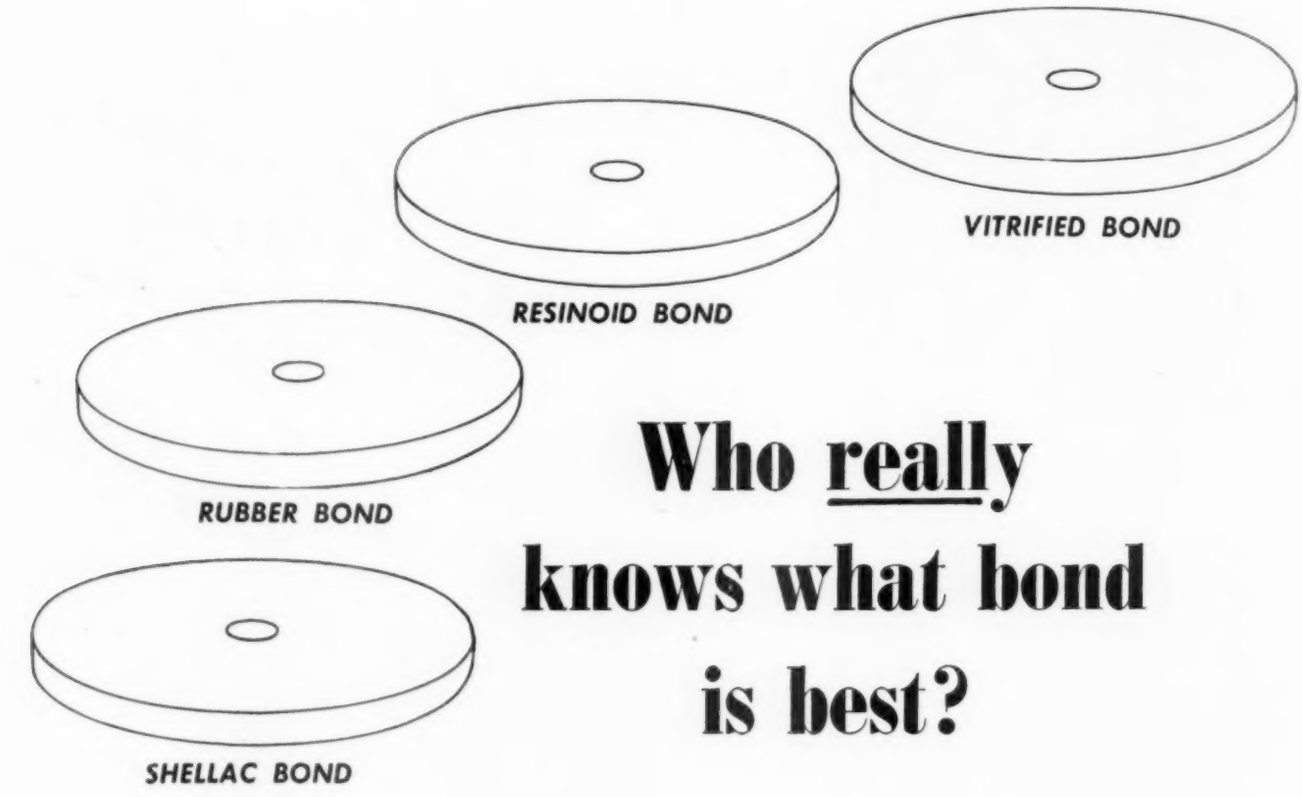
Republic PIG IRON

"CHATEAUGAY" Low-Phosphorus, Copper-Free

"REPUBLIC" (Northern) Foundry, Basic and Malleable

"PIONEER" (Southern) Foundry and Basic

ALSO TRUSCON FOUNDRY FLASKS • REPUBLIC CORE WIRE • FOUNDRY NAILS



Who really knows what bond is best?

Your experience tells you this is a tough one to answer. You've seen what correct bond selection means in faster, better grinding at less cost. You know the importance of the right bond in terms of maximum cut with minimum pressure and lowest wheel loss.

You have probably seen one of your own shop experts worried with what seemed a logical choice. For, there's plenty of room for error in evaluating the many variable factors involved.

For instance, the speed of the grinder, tolerance limits, or production schedules are but a few of many factors to be considered. Yet, neglecting one...even partially...will upset the calculated performance of the wheel you choose.

To help you make the best choice of wheels, CARBORUNDUM has organized a system of checks and balances. It offers you a practical service...service easy to use...service depended on by many successful concerns.

CARBORUNDUM salesmen and our distributor's representatives are your contact with this service. They are familiar with your needs. They are informed on latest abrasive developments. Supporting them in the field are our Abrasive Engineers...qualified to solve tough grinding problems. And here, in the modern laboratories of CARBORUNDUM, are scientists and technicians probing grinding practices in the light of abrasive development. As a result, they usually come up with the most direct solution to difficult grinding problems.

There is no better way to find out what bond is really best, or what wheel to use, than to depend on this organized service. It is a smooth working combination of knowledge and experience. Call in CARBORUNDUM. There is no surer means of making certain you are getting the best. The Carborundum Company, Niagara Falls, New York.

A good rule for good grinding... **CALL IN**

CARBORUNDUM

TRADE | MARK

BONDED ABRASIVES

WHEELS
- Silicon Carbide
- Aluminum Oxide
- Diamond

Cylinder Hones
Sticks, Stones & Rubs
Specialties

COATED ABRASIVES

Paper, Cloth and Combination

Sheets, Rolls, Discs

ABRASIVE GRAINS AND COMPOUNDS

for:

Polishing
Lapping
Pressure Blasting
Finishing

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company

REDUCE YOUR REJECTS WITH POSITIVE VENTING

Are your cores positively vented? Sure! you say, the vents are put in when the core is made. But too often, by the time the coring-up floor is reached, a vent has become crushed, or it is discovered that somebody forgot to open one. One clogged vent can cause a blow and a rejected casting.

The way to insure that vents have been properly opened is to put them in *after* the core or mold has been dried. The safest and quickest way to do this is to use the small I-R air-drill. It permits positive control of the venting, the size of the opening and the number and the location of each one. The speed with which it makes a clean hole is amazing.

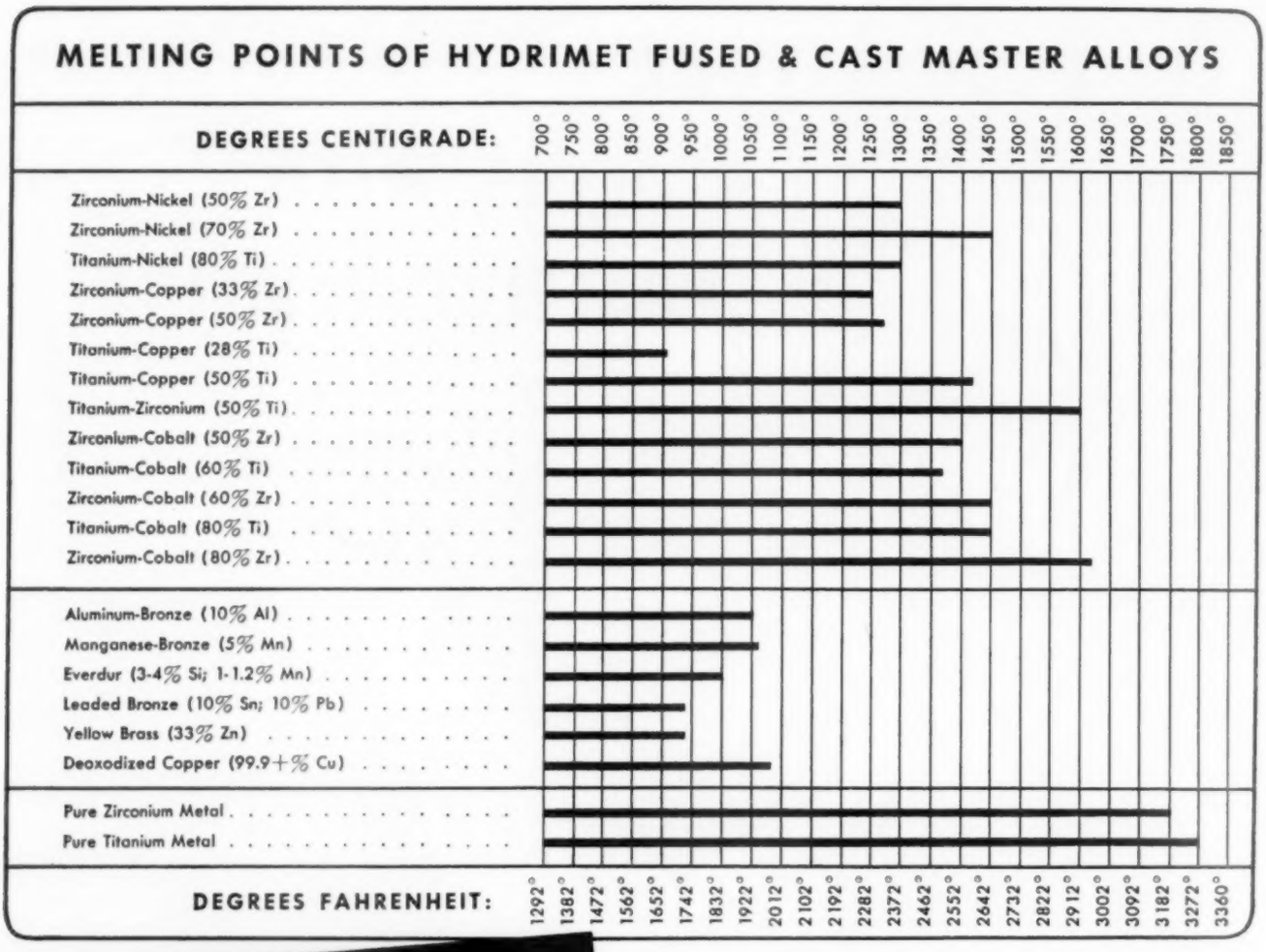
This same lightweight air drill finds many other uses in the foundry, such as drilling holes for chill nails—digging out hooks—cutting grooves and gutters—assembling cores, etc.

Put these I-R air drills to work on positive venting and put your mind at ease. If once you try this handy air drill, you will find dozens of uses for it.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 9-831

DRILLS • GRINDERS • CHIPPERS • RIVETERS • WRENCHES • HOISTS


MELTING POINTS OF HYDRIMET FUSED & CAST MASTER ALLOYS
DEGREES CENTIGRADE:
700° 750° 800° 850° 900° 950° 1000° 1050° 1100° 1150° 1200° 1250° 1300° 1350° 1400° 1450° 1500° 1550° 1600° 1650° 1700° 1750° 1800° 1850°
Zirconium-Nickel (50% Zr)
Zirconium-Nickel (70% Zr)
Titanium-Nickel (80% Ti)
Zirconium-Copper (33% Zr)
Zirconium-Copper (50% Zr)
Titanium-Copper (28% Ti)
Titanium-Copper (50% Ti)
Titanium-Zirconium (50% Ti)
Zirconium-Cobalt (50% Zr)
Titanium-Cobalt (60% Ti)
Zirconium-Cobalt (60% Zr)
Titanium-Cobalt (80% Ti)
Zirconium-Cobalt (80% Zr)
Aluminum-Bronze (10% Al)
Manganese-Bronze (5% Mn)
Everdur (3-4% Si; 1-1.2% Mn)
Leaded Bronze (10% Sn; 10% Pb)
Yellow Brass (33% Zn)
Deoxodized Copper (99.9+% Cu)
Pure Zirconium Metal
Pure Titanium Metal
DEGREES FAHRENHEIT:
1292° 1382° 1472° 1562° 1652° 1742° 1832° 1922° 2012° 2102° 2192° 2282° 2372° 2462° 2552° 2642° 2732° 2822° 2912° 3002° 3092° 3182° 3272° 3360°

Many new alloy combinations now possible

. . . Also elimination of hot working

Study the above chart carefully. Note for yourself the many new alloy combinations Hydrimet Fused and Cast Master Alloys now make possible. Alloy combinations which may give you just the special characteristics for which you have been searching.

But this is not the whole story. Hydrimet Fused and Cast Master Alloys often can eliminate hot forging or hot rolling operations, previously required before fabrication. Their purity is so high that, when added to other molten metals, they show extremely high recoveries and usually eliminate completely all problems of gas porosity. Thus, the alloy combinations produced are sound, homogeneous ingots, in many cases satisfactory for direct fabrication purposes.

Data Sheets, giving specific characteristics and recommended melting and heat treating practices, are available for all the Hydrimet Fused and Cast Master Alloys listed in the above chart. Other special Fused and Cast Master Alloys, ternary as well as binary, can be produced to suit individual requirements. A wide range of Master Alloy Powders also can be supplied. *Write for information to Dept. G.*

METAL HYDRIDES INCORPORATED

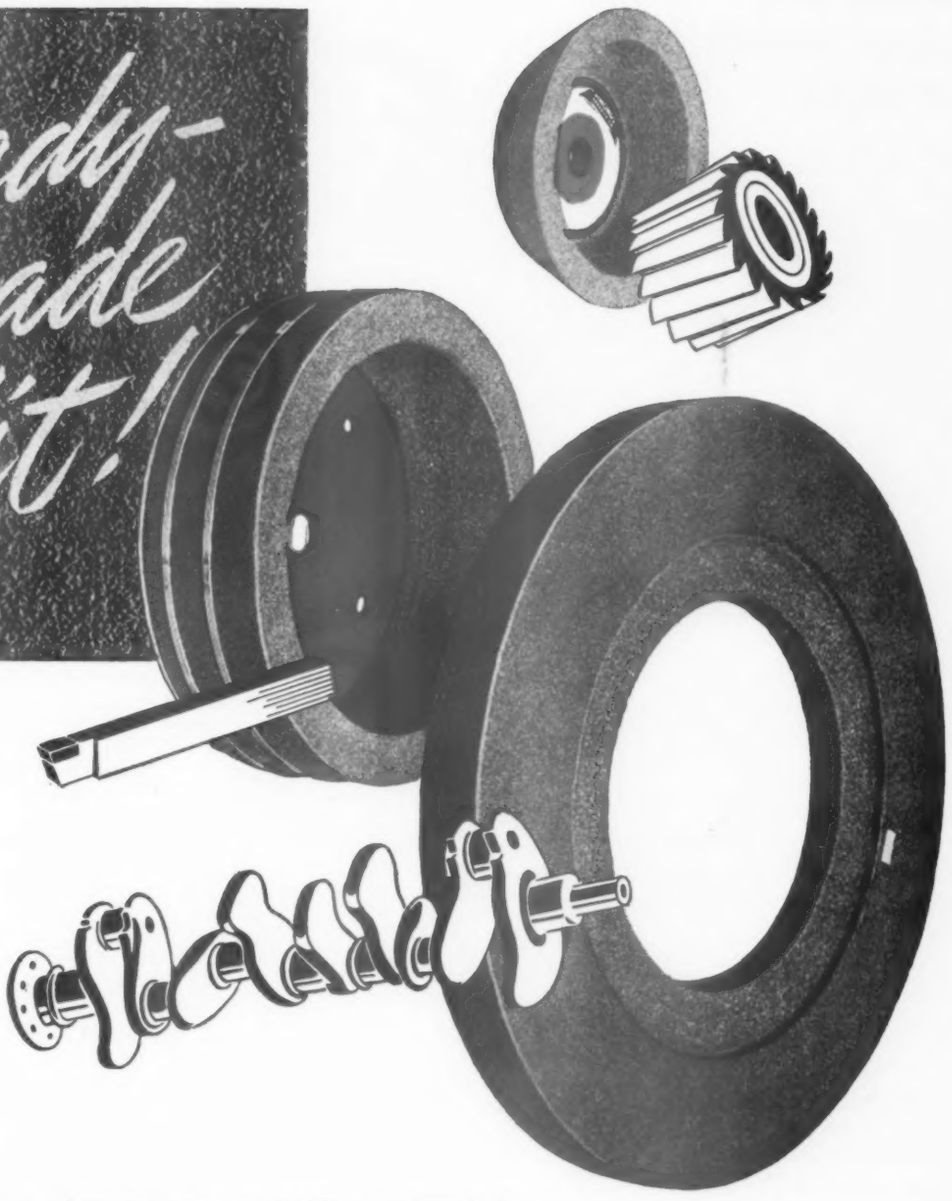
Calcium Hydride is a foolproof, convenient, easily transported source of pure hydrogen.

HYDRIMET PRODUCTS: TITANIUM HYDRIDE • TITANIUM POWDER • TITANIUM INGOTS • ZIRCONIUM HYDRIDE ZIRCONIUM POWDER • ZIRCONIUM INGOTS • METAL NITRIDES COPPER-TITANIUM • COPPER-ZIRCONIUM • BERYLLIUM-NICKEL TITANIUM-NICKEL • ZIRCONIUM-NICKEL • COLUMBIUM COBALT ALLOYS • CALCIUM HYDRIDE • TANTALUM

Helping Industry to Put the Right Metal in the Right Place

16 Congress Street, Beverly, Massachusetts

Ready-made to fit!



For rough grinding and snagging; for micro-inch accuracy finishing—on through the entire range of production and tool-room requirements, Simonds* Borolon and Electrolon Grinding Wheels meet the major needs of all industry. Thousands and thousands of combinations of various types and sizes of grain in as many different structures with Vitrified, Silicate or Resinoid Bond complete a "ready-made" line of abrasive products which permit perfect "fit" for all conditions. Simonds Grinding Wheels; Segments; Mounted Wheels and Points; Grains, Bricks and Sticks, effect production economies; bring new abrasive efficiency when requisitioned for specific jobs on specific materials under specific machine conditions.

For assistance in requisitioning the correct Borolon and Electrolon products consult distributors in all principal cities. Over a half century of Simonds Abrasive Company Grinding Wheel experience is available through them. Specifications are clearly marked on all Simonds grinding wheels. If you would like a marking specification chart, write us.

**** Time-honored Borolon and Electrolon Abrasive Products are now distinguished by the name Simonds.***

SIMONDS ABRASIVE CO. *Is a Division of*

SIMONDS SAW AND STEEL CO

Other affiliated companies:

SIMONDS ABRASIVE CO. · SIMONDS STEEL MILLS

SIMONDS ABRASIVE CO.

SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

GOVERNMENT-OWNED SURPLUS PRODUCTION EQUIPMENT

SPEED LATHES

⅛ TO 5 H.P. STANDARD MAKES AT LOW COST

Speed Lathes like this are just one of dozens of kinds of modern machine tools now available from government surpluses. For instance look at the equipment shown on the three preceding pages. Of *immediate* machine tool need there is scarcely one which cannot be met quickly, and at low cost, from War Assets Administration stocks—and additional equipment is being declared surplus regularly. One of industries' and government's major post war tasks is to put this equipment to productive use quickly. More specifically —where can *you* use one or more of these speed lathes profitably? Find out today and contact any War Assets Administration Office.

WHERE SPEED LATHES ARE!

W.A.A. Regional Office	½ HP—	½ to 1 HP	1 to 3 HP	3 HP—
Detroit	204	231	147	22
Chicago	97	86	87	65
Boston	33	89	.....	.....
Cleveland	57	32	19	.....
New York	6	.....	3	.....
Denver	11	60	.....	.....
St. Louis	155	.....	26	.....
Minneapolis	67	14	6	.....
Spokane	3	11	.....	.....

CHECK AND MAIL TODAY

To War Assets Administration:
Without obligation, please send me the following information on lathes:

	MAKE	MODEL	SIZE
Speed Lathes ☐	.....	.....	.....
Multi-cut Lathes ☐	.....	.....	.....
Other types ☐	.....	.....	.....

Name.....

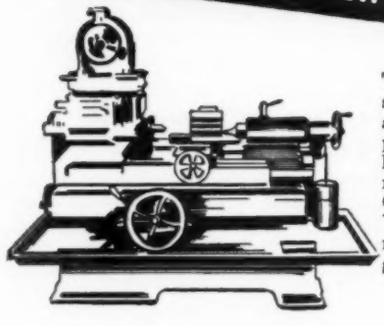
Firm.....

Address.....

City.....State.....

277-3

SMALL PIECE MULTI-CUT PRODUCTION LATHES



These Reid lathes may ... stripped and retooled ... any special kind of ... production work. Machi... located principally in B... mingham, Boston, Chica... Cleveland, Detroit, N... York, Philadelphia, Ri... mond and St. Louis R... gional Offices.

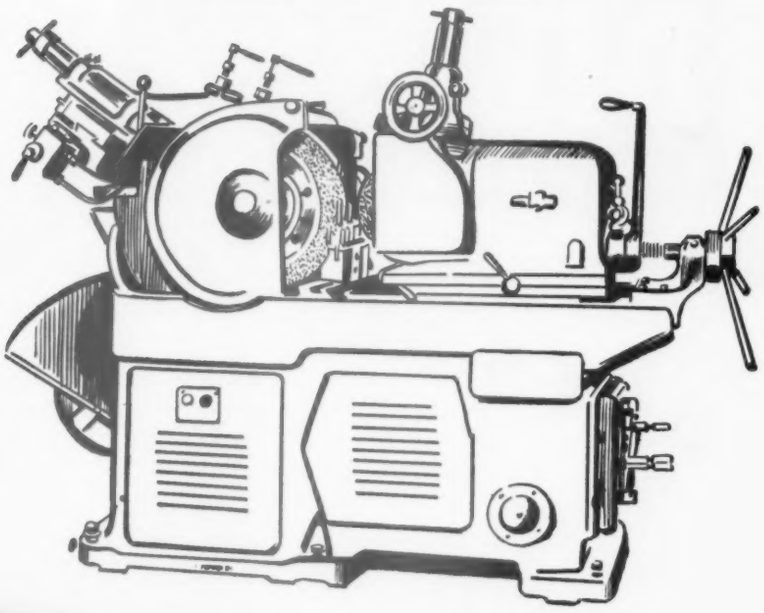
WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

GOVERNMENT-OWNED SURPLUS PRODUCTION EQUIPMENT

CINCINNATI CENTERLESS GRINDERS: Model No. 2 located in Detroit, Chicago, Cleveland, Boston, Philadelphia and New York; Model No. 3 located in Detroit, Chicago, Cleveland, and Boston Regional Offices.



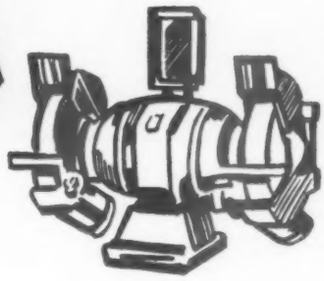
STANDARD MAKES

STANDARD MODELS

CENTERLESS GRINDERS

Do you need additional machine tools for new operations . . . or to speed up old? Thousands of machine tools, like these grinders, are surplus and available to you at low cost. The equipment is modern; much of it unused, some only slightly used. Look today for places to use this equipment. You will be rendering a vitally important service—not only to yourself as a producer and taxpayer—but also to the country as a whole. These tools *must* go to work to produce badly needed peace time products.

BENCH GRINDERS



BROWN-BROCKMEYER: 2-wheel, electric bench grinders in 8" and 10" wheel sizes located in San Antonio Regional Office of War Assets Administration.

VETERANS OF WORLD WAR II

To help you in purchasing surplus property, veterans' units have been established in each War Assets Administration Regional Office.

MAIL TODAY

To War Assets Administration:

Please send me information on the availability of the following types of grinders:

MAKE	MODEL	SIZE	
.....	.....	.....	Centerless grinders
.....	.....	.....	Bench grinders
.....	.....	.....	.....grinders (other)

Name.....

Firm.....

Address.....

City.....State.....

277-3

WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

DILL, Inc.
RUSHVILLE, INDIANA.

. . . GOES ALL OUT FOR DIAMOND

Originators of

SNAP FLASKS

HERE in their new modern daylight foundry they find Diamond Flask Molding Equipment giving them uninterrupted production of fine gray iron castings.

This is typical of a host of other foundries using Diamond Flask Equipment for the past 57 years.

DIAMOND

CLAMP AND FLASK COMPANY

Telephone 2553 — Richmond, Indiana

Designers of CORE PLATES, JACKETS, BANDS, FLASKS *since 1889*

STOP LOSING MONEY

STOP LOSING MONEY

STOP LOSING MONEY

...get faster-baking cores

STOP LOSING MONEY with slow-baking cores that tie up your ovens! Cores bonded with Hercules Truline* Binder bake up to 25% faster, often eliminate one extra trip through tower ovens.

STOP LOSING MONEY

STOP LOSING MONEY with cores that are hard to shake out! Truline-bonded cores burn out quickly, shake out easily, save as much as 50% of valuable cleaning time.

STOP LOSING MONEY with cores that lose strength in storage. Moisture-resistant Truline Binder produces cores that can be stored with no appreciable loss of strength.

STOP LOSING MONEY with less efficient binders! Let an experienced Hercules representative suggest ways to apply economical Truline Binder in your foundry. Mail the coupon today for a sample and a descriptive book, giving laboratory-tested mixes.

HERCULES
TRULINE BINDER

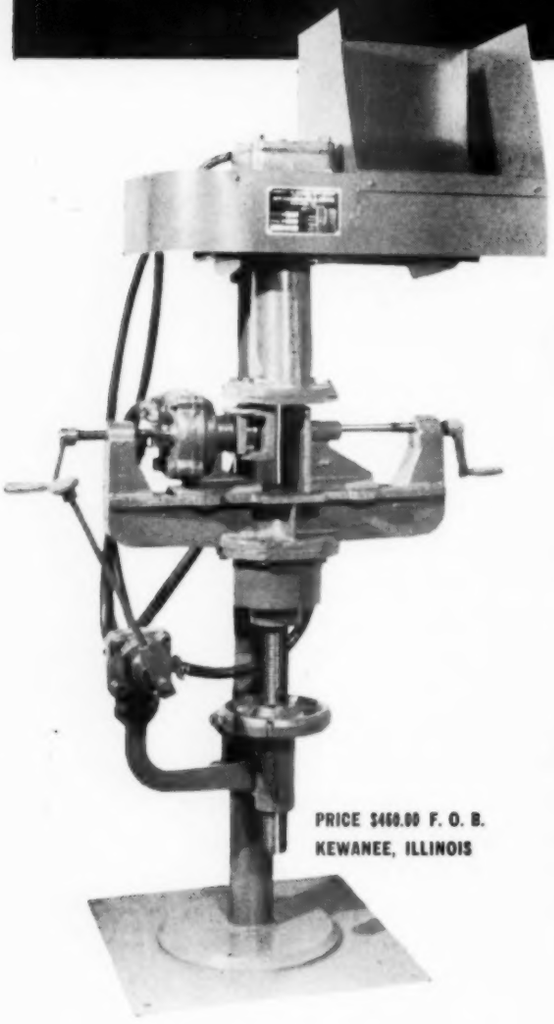
*REG. U. S. PAT. OFF. BY HERCULES POWDER COMPANY

SEE US AT THE FOUNDRY SHOW, BOOTH 323

Naval Stores Department
HERCULES POWDER COMPANY
INCORPORATED
999 Market St., Wilmington 99, Del.
Send information on Truline Binder ☐ and a sample ☐

Name_____
Company_____
Title_____
Street_____
City_____ State_____ NB-61

Announcing the DEMMLER NO. 50



PRICE $460.00 F. O. B.
KEWANEE, ILLINOIS

THE SMALL, LOW COST CORE BLOWER YOU'VE BEEN WAITING FOR

Here at last is the answer to the rapid and profitable production of small, high quality cores. It's especially adapted to short run jobs because of its quick, easy adjustments. The Demmler No. 50 is a low cost dependable machine capable of blowing 200 cores an hour—every hour—with characteristic Demmler high efficiency. The Demmler No. 50 is not a gadget—it's a complete machine equipped with both vertical and horizontal automatically operated air clamps. In fact, most of the important features of larger Demmler models are found on this reasonably priced machine.

By means of a single hand valve, the core box is clamped and the core blown in but three seconds!

The No. 50 will blow cores up to three pounds in weight.

The height of the table is adjustable from 30 to 36 inches— a comfortable working height. Connect the No. 50 to an air hose and the machine is ready to use.

You'll be as proud of your investment ten years hence as you are today!

SEE THE NEW DEMMLER NO. 50 AT THE FOUNDRY CONVENTION

WRITE FOR FOLDER

MANUFACTURERS OF CORE BLOWING EQUIPMENT EXCLUSIVELY **SINCE 1911**

Wm. DEMMLER & Bros.
Kewanee, Illinois

COMPANION GRINDERS FOR HIGH SPEED PRODUCTION

No. 20 Pneumatic Grinder. This air-driven rotary model has governor control which insures steady speed under load. Free speed of 17,000 and 12,000 rpm. For use with wheels 1¼ to 2½ inches.

No. 2RG-25 Grinder. For all-day production grinding of the many fine, lightweight jobs in foundries and pattern shops. Assures continuous high-speed operation. Plenty of speed for small grinding wheels where space is limited. Power for use with grinding wheels up to 1¼ inches in diameter. 25,000 rpm.

Pneumatic Grinders are available in sizes for all types of foundry work . . . high-speed heavy grinding such as iron and steel castings, billets, large dies, acetylene and electric welds. Perfect balance insures smooth operation.

Keller Pneumatic Grinders are easy to operate. Merely attach an air line, insert a mounted grinding wheel in collet chuck and they are ready to go to work.

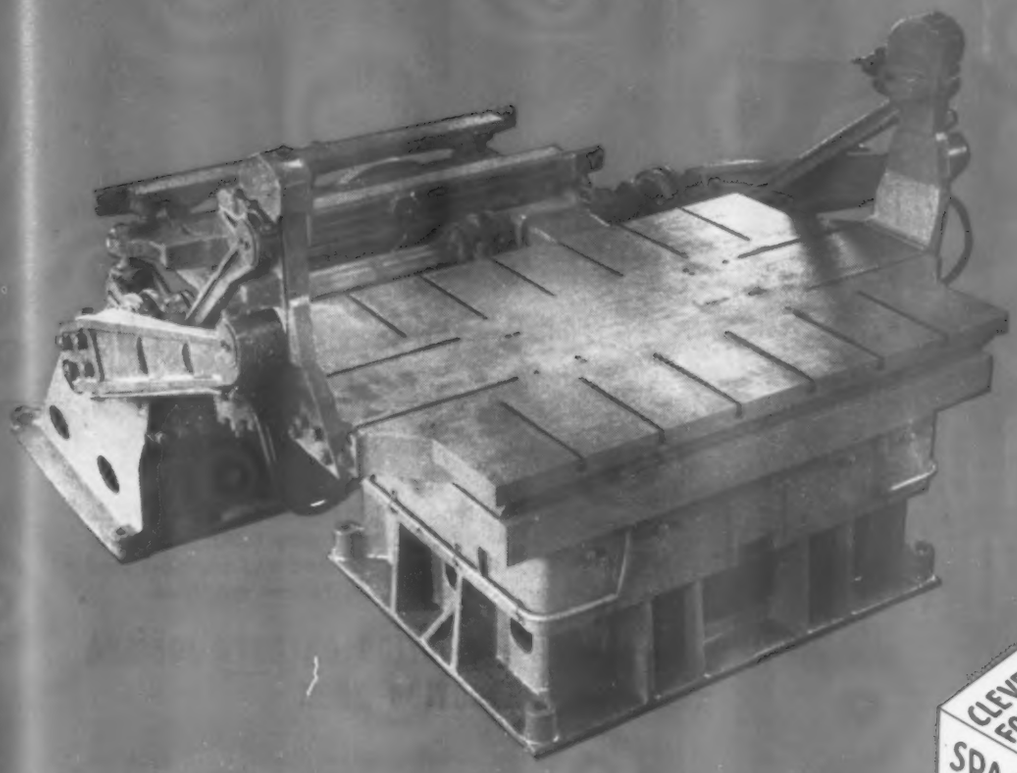
For burring operations, cutters are available for use in place of mounted grinding wheels. These grinders are great favorites for burring and removing fins.

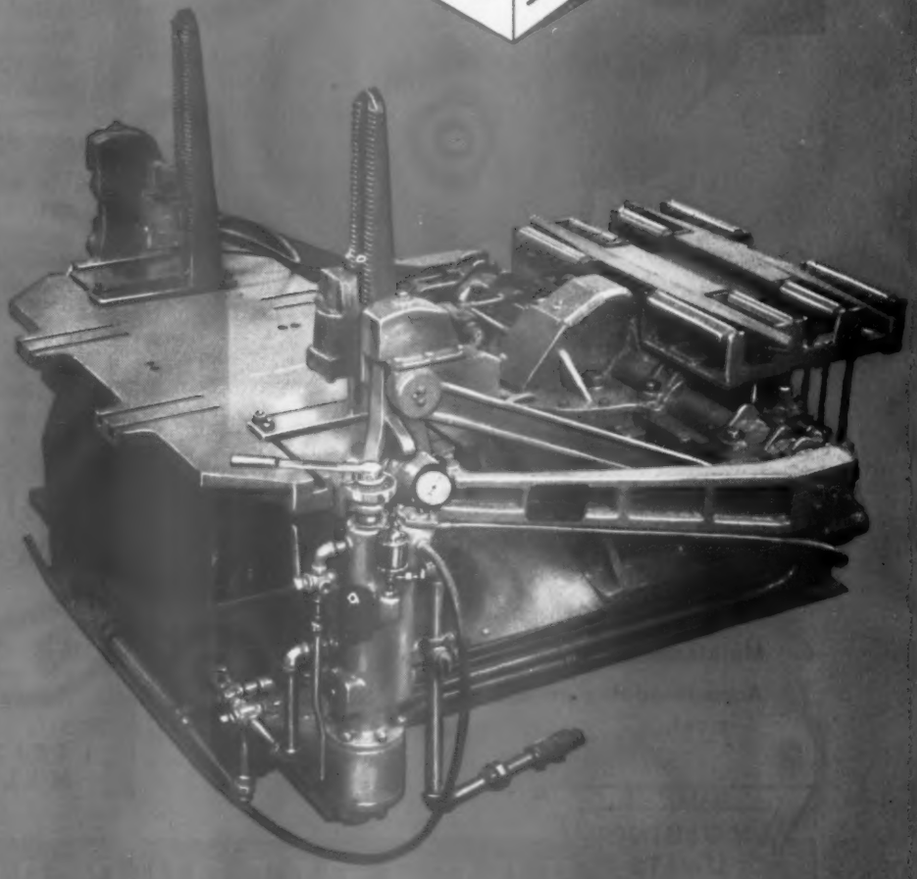
In pattern shops, on both metal and wood patterns and core boxes, Keller grinders are useful for the numerous roughing and finishing operations.

KELLER
Pneumatic Tools

KELLER TOOL COMPANY • 4605 LAKE ST. • GRAND HAVEN, MICH.

FOUNDRY CONVENTION
SPACE 1425
SPACE 1425
HERMAN PNEUMATIC MACHINE CO.
UNION BANK BUILDING
PITTSBURGH 22, PA.
Will see you at the Foundry Convention, Cleveland-Bill
SPACE 1425
HERMAN

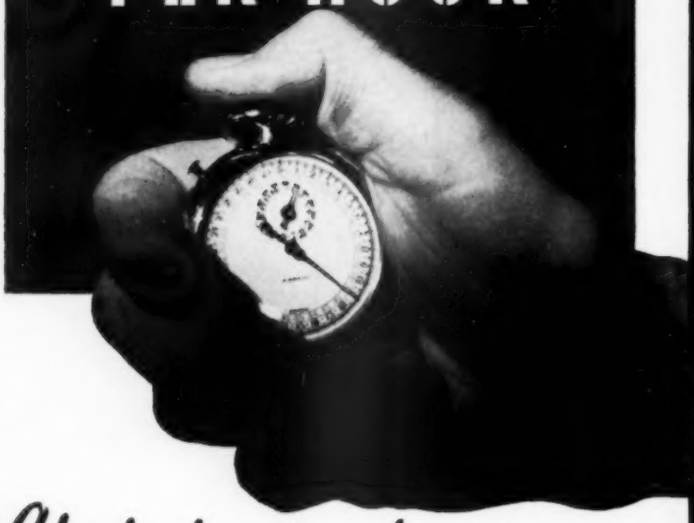




Hydro-Centrifugal Casting Machines • Plain Jarring Machines (Jarring Capacities from 615 lbs. to 140,000 lbs.) • High Speed Pitless Type Jarr Rollover and Pattern Drawing Machines • Jarr Rollover and Pattern Drawing Machines (To 40,000 lbs. Rollover Capacity) • Jarr Stripping Machines (All Sizes) • Independent Rollover and Pattern Drawing Machines (To 40,000 lbs. Rollover Capacity) • Jarr Pin Pushoff Machines • Independent Stripping Machines (All Sizes) • Jarr Core Rollover and Draw Machines • Independent High Speed Pitless Type Rollover and Pattern Drawing Machines • Independent Core Rollover and Draw Machines • Independent Pin Pushoff Machines

MOLDING MACHINES

360 SNAP MOLDS PER HOUR



NOW! PROGRESSIVE MOLDING OF SNAP MOLDS FROM MATCH PLATES

Yes, this outstanding production is now possible with progressive molding of snap molds and *fewer machines.* It's all in the method and machines used —the Fellows method and Fellows machines.

SAME PRODUCTION ON BOTH JOBBING AND PRODUCTION WORK

The method not only solves the age-old problem of obtaining more production from match plates but minimizes the fatigue factor. Eight men make sixteen different sized molds successively using only four machines and two sand hoppers. Unskilled men become efficient for any of the operations in a few minutes. The arrangement of the unit is such that maximum production is made in a minimum of space and the rate of production is maintained regardless of the size of molds or the number of cores.

The machines are simple in design and sturdy in construction to assure an absolute minimum of maintenance and down time. They are the first molding machines ever designed for the progressive molding of snap molds. They were designed to bring the efficiency of this foundry operation on a par with mass production methods. This new line of thought is now open to foundrymen and engineers seeking the maximum in mold making efficiency.

Check these 7 advantages:

1. **Produces as many as 360 molds per hour.**
2. **Simplifies work, eliminates fatigue.**
3. **Unskilled labor produces maximum production.**
4. **Maximum production available regardless of size of flask and number of cores.**
5. **Maximum production per man hour and per square foot area.**
6. **Maintenance cost reduced to a minimum.**
7. **Accommodates present pattern and flask equipment.**

VISIT OUR BOOTH NO. 1828 FOR ADDITIONAL INFORMATION

Complete data will be available at the Foundrymen's Convention in Cleveland May 6-10. You are invited to check further on this highly productive molding unit.

1012 NORTH 3RD STREET, MILWAUKEE, WISCONSIN

SIMPLE MOLDING UNITS F COMPACT EFFICIENT

THE FELLOWS CORPORATION

Silvery ingots are easier to handle. They can be unloaded, stored and delivered to the charging floor by magnet.
There is less silicon loss by oxidation during melting when Silvery ingots are used.
All the elements comprising Silvery ingots are essential to and recovered in the melt.
A composition of Silvery ingots can be readily checked by analysis to assure the foundryman that he receives what he pays for.
Melting of Silvery ingots progresses in a manner similar to that of other ingredients of the charge.

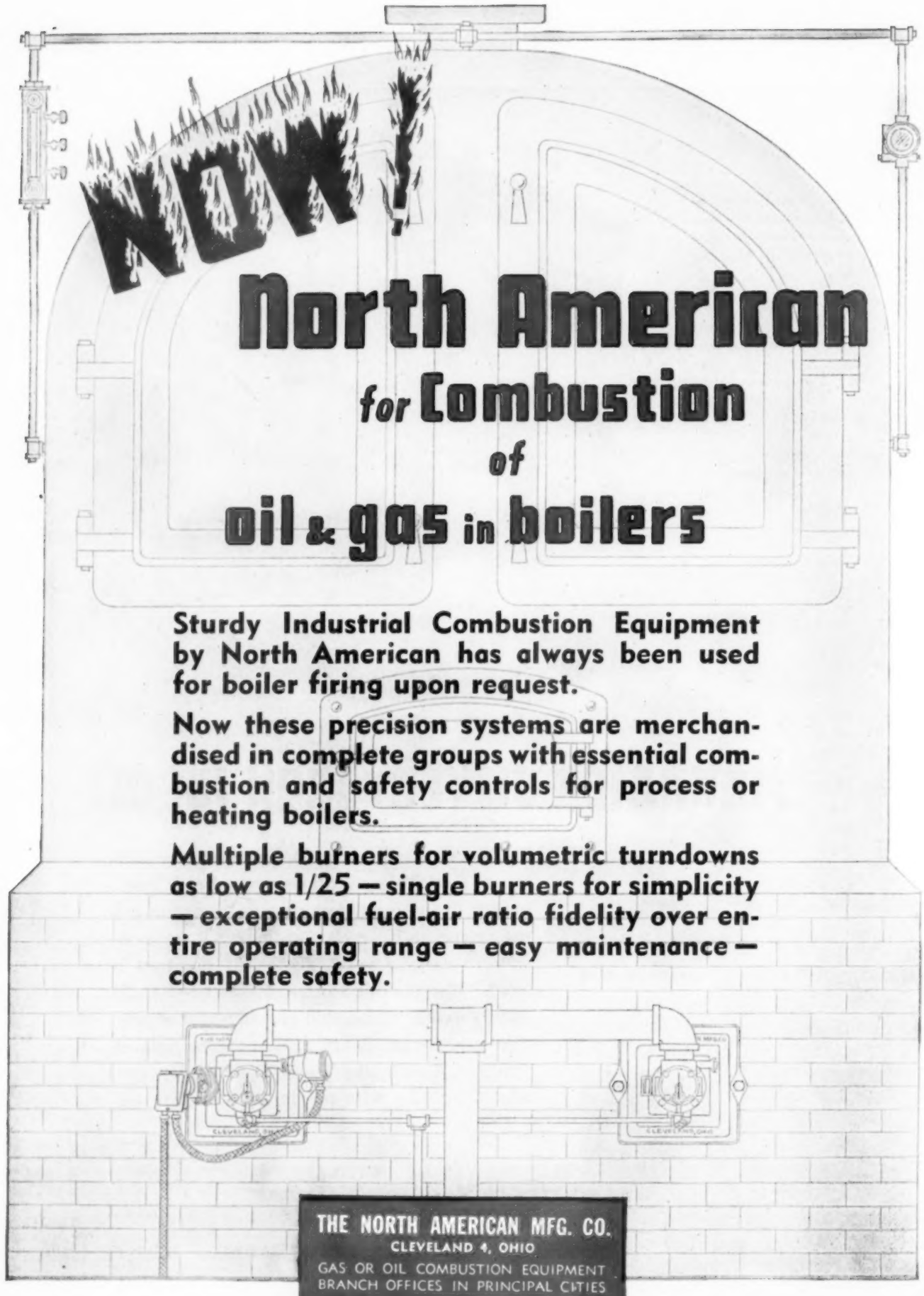
HANNATEN SILVERY IRON INGOT

Produced in silicon grades from 8% to 17%, HannaTen Silvery Iron Ingot makes it possible for the foundryman to control accurately the silicon in his melt . . . makes it unnecessary to carry several grades of pig iron in stock. The 10-pound ingot is easier to handle, more flexible in use, and provides a finer grain structure for stronger, more uniform finished castings. You'll like HannaTen Silvery Iron Ingot. Specify it for maximum savings.

THE HANNA FURNACE CORPORATION

BUFFALO • DETROIT • NEW YORK • PHILADELPHIA • BOSTON

MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION


NOW!
North American
for Combustion
of
oil & gas in boilers
Sturdy Industrial Combustion Equipment by North American has always been used for boiler firing upon request.
Now these precision systems are merchandised in complete groups with essential combustion and safety controls for process or heating boilers.
Multiple burners for volumetric turndowns as low as 1/25 — single burners for simplicity — exceptional fuel-air ratio fidelity over entire operating range — easy maintenance — complete safety.
THE NORTH AMERICAN MFG. CO.
CLEVELAND 4, OHIO
GAS OR OIL COMBUSTION EQUIPMENT
BRANCH OFFICES IN PRINCIPAL CITIES

There's a Hidden Gold Mine in your USED CORE WIRE!

RECLAIM IT WITH KANE & ROACH CORE WIRE STRAIGHTENERS

Savings up to $150 a month are often reported by enthusiastic users of Kane & Roach Core Wire Straighteners! Don't neglect this hidden source of cash! Your used wire—even if it's badly bent—can be restored over and over again with these fast-working, economical machines. Now—when conservation of all metal is a vital factor in war-industry, Kane & Roach Straighteners fulfill a more important need than ever. Kane & Roach machines not only save valuable core wire but they pay for themselves so fast that scores of foundrymen have reordered as many as three or four after a short trial of one.

Here's Why Kane & Roach Is Your Best Bet!

There's an excellent reason why Kane & Roach Straighteners are in such demand—that's because they're built to do a long-term heavy-duty job, and do it better, faster and cheaper. This claim is substantiated by foundrymen everywhere—who know and rely on Kane & Roach, the company that has specialized in designing and building high-quality straighteners for the steel industry since 1887. You owe it to yourself and to the industry to invest in a K&R machine for superior straightening of badly-needed core wire.

The NEW K & R CORE WIRE STRAIGHTENER

Works Better, Lasts Longer, because . . .

- 3 ADDITIONAL straightening rolls plus the pinch rolls, all of hardened steel.
- Roll gears are cut-steel, hardened.
- Drive gears run in oil.
- Maximum safety—guard encloses all moving parts.
- Pressure-release cam handles prevent jamming.
- Motor drive shielded from grit.
- Cabinet base encloses and protects sturdy, high-power motor.
- Extraordinarily long wear for all parts.
- Cut-off can be furnished for straightening and cutting new wire from the coil.

K&R

Cash in NOW! Send today for our new circular 58-B—the first step to savings.

KANE & ROACH, Inc., Syracuse, N. Y.

I want to know more about K&R new core wire straighteners. Send me Bulletin 58-B, without obligation. My sizes of wire are: .....

Company .....

Individual .....

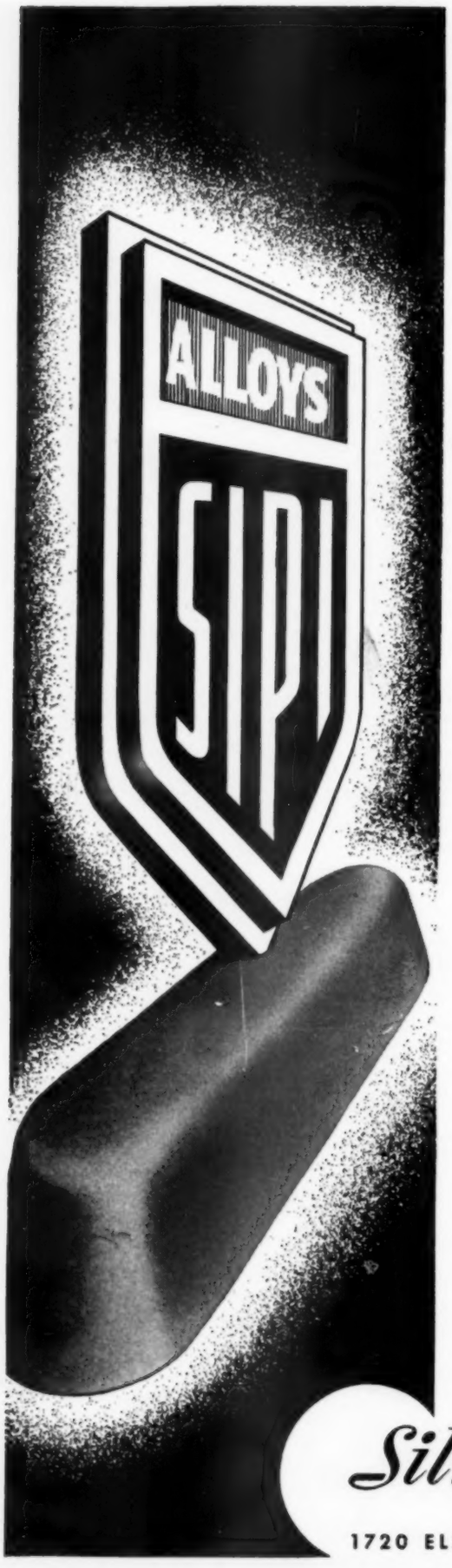
Street .....

City and State .....

KANE & ROACH

SHONNARD AND NIAGARA STS.

SYRACUSE, N. Y., U.S.A.



...a symbol of *Quality* in Bronze Ingots

We produce but one grade . . . the best. This high standard of quality rarely varies—and then only when the diligent research and skill of our plant and laboratory technicians suggest ways to improve it. SIPI Alloys are made under the closest metallurgical control . . . from the selection of raw materials through the final process . . . to safeguard against the slightest variance in uniformity. Regardless of how rigid or exacting your specifications may be, specify SIPI Alloys as a guarantee of dependable quality.

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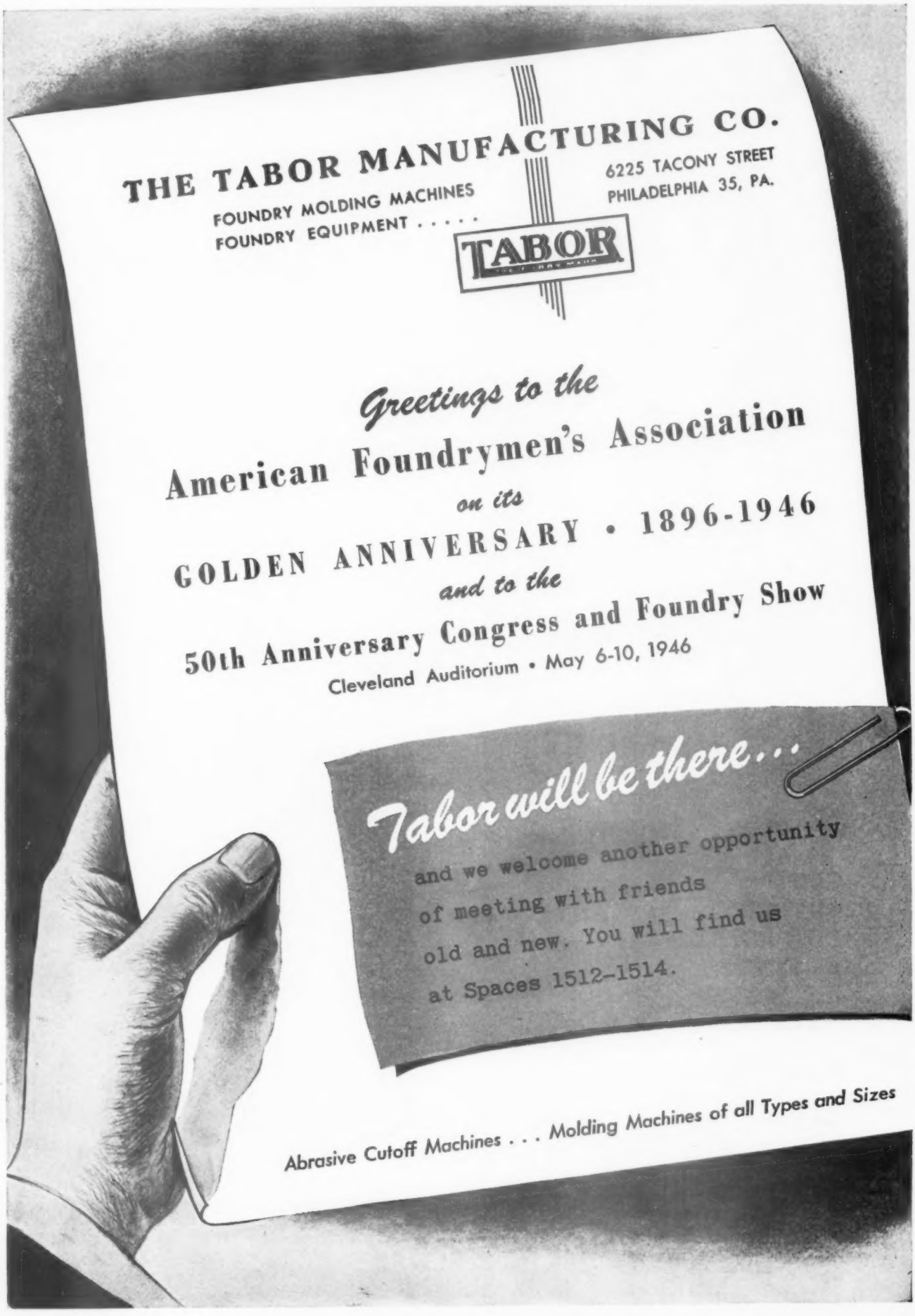
THE TABOR MANUFACTURING CO.
FOUNDRY MOLDING MACHINES
FOUNDRY EQUIPMENT . . . . .
6225 TACONY STREET
PHILADELPHIA 35, PA.
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Greetings to the
American Foundrymen's Association
on its
GOLDEN ANNIVERSARY • 1896-1946
and to the
50th Anniversary Congress and Foundry Show
Cleveland Auditorium • May 6-10, 1946
Tabor will be there . . .
and we welcome another opportunity
of meeting with friends
old and new. You will find us
at Spaces 1512-1514.
Abrasive Cutoff Machines . . . Molding Machines of all Types and Sizes

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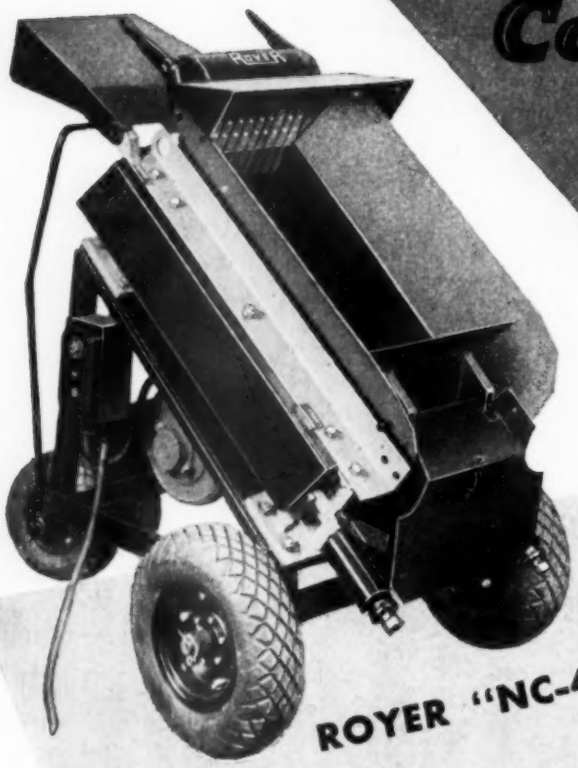
LOWER LAKESIDE SECTION



ROYER "NC-4"

ROYERS MAKE SAND PREPARATION THE STRATEGIC COST-LOWERING OPERATION

GET THE REASONS WHY OVER 7200 ROYERS HAVE BEEN SOLD

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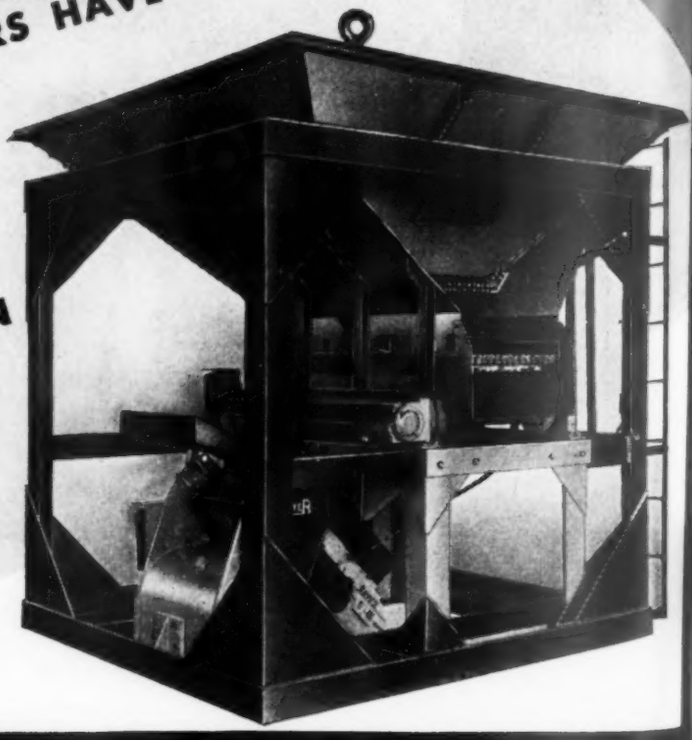

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If you are unfortunate and miss the show—write for Catalog No. 744.

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What Makes Royers "Foundry Firsts"!

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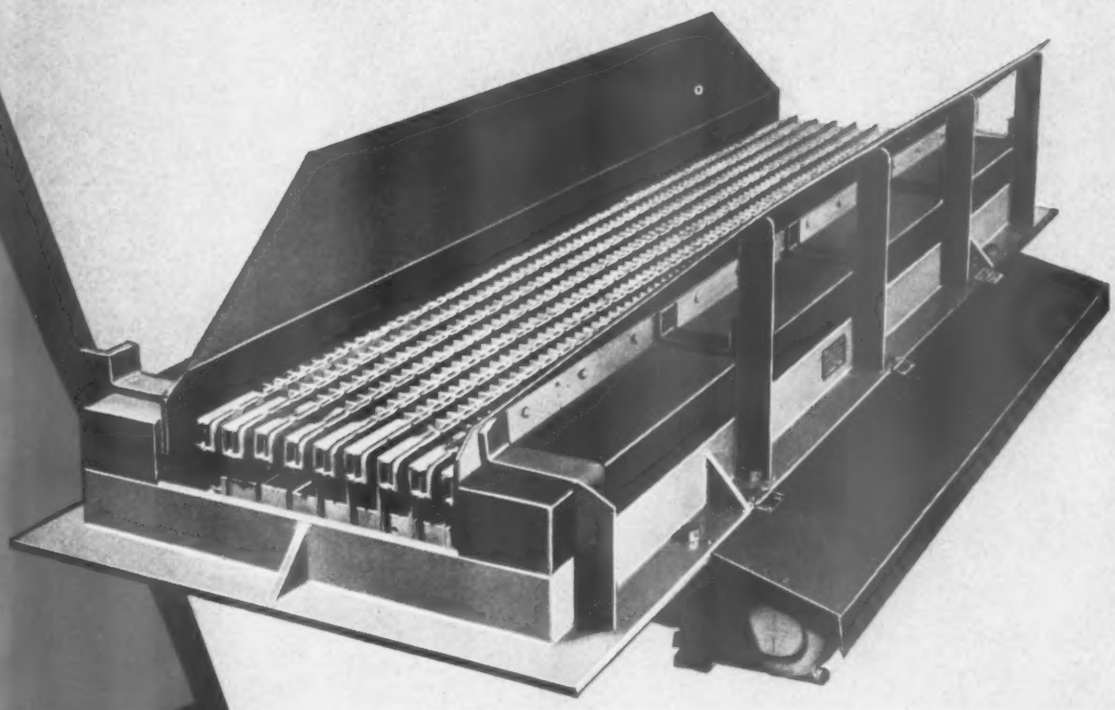


STEADY! FAST! TOUGH!

THE ROYER

ROYER FOUNDRY & MACHINE CO.
KINGSTON, PA.

CONVENTION

One of the many advantages of GAS and MODERN GAS EQUIPMENT—

The flexibility of modern Gas equipment can, in great part, be credited with the introduction of heat treating to the production line, speeding manufacturing processes, enhancing efficiency, improving products. The catalogue of Gas equipment for industrial heat treating is well nigh limitless—it is added to almost daily as research of the American Gas Association and equipment manufacturers broaches new frontiers in service to industry.

Added to the accurate controllability of Gas and its economy in both unit and overall costs, the flexibility of this modern industrial fuel appeals to executives and production men in every type of plant. Whether it is melting huge ingots or annealing the delicate glass and metal sub-assemblies for electronic tubes, there is specialized Gas equipment that is unexcelled for each job.

If you will advise your local Gas Company's Industrial Engineers of your problems in industrial heat applications, and what you are anxious to secure in flexibility, speed, economy, better products, they will, without obligation, offer the best solution.

AMERICAN GAS ASSOCIATION

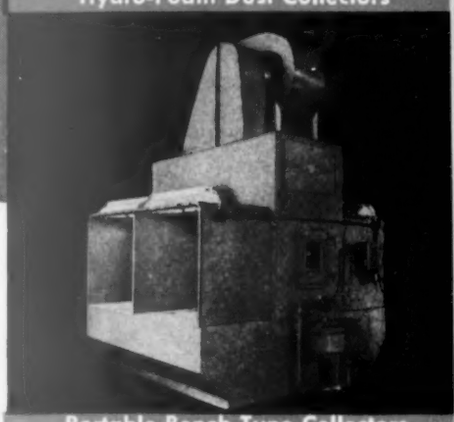
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

THE TREND IS TO GAS

FOR ALL INDUSTRIAL HEATING

FOUNDRY Equipment

Hydro-Foam Dust Collectors



Portable Bench Type Collectors

Sand Mould Spray Booths

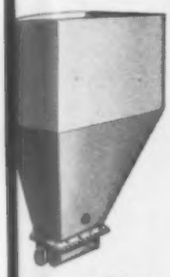
. . . Equipment Designed to do a Specific Job with Greatest Efficiency and Utmost Economy

The Mahon organization, through its close contact with foundrymen throughout the country, is today away ahead of demands for new methods and new labor-saving, cost-reducing equipment. Several of the foremost foundries in this country, have been equipped with complete Mahon systems for baking, spraying and drying cores and moulds...in each instance, these complete systems were planned and engineered with perfect coordination and balance to do a specific job at lowest possible unit cost. Regardless of what your present equipment requirements may be—from a small batch-type bake oven, to an elaborate conveyorized system—Mahon engineers will gladly give you the benefit of their vast experience in the foundry equipment field. Address correspondence to Foundry Equipment Division.

THE R. C. MAHON COMPANY

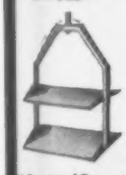
HOME OFFICE AND PLANT, Detroit 11, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

CIAL PURPOSE EQUIPMENT



nd Storage Bins

ling Tanks with Exhaust



l Racks (Conveyor)

ore Rack Trucks

x Type g Doors

cal Conveyor Types

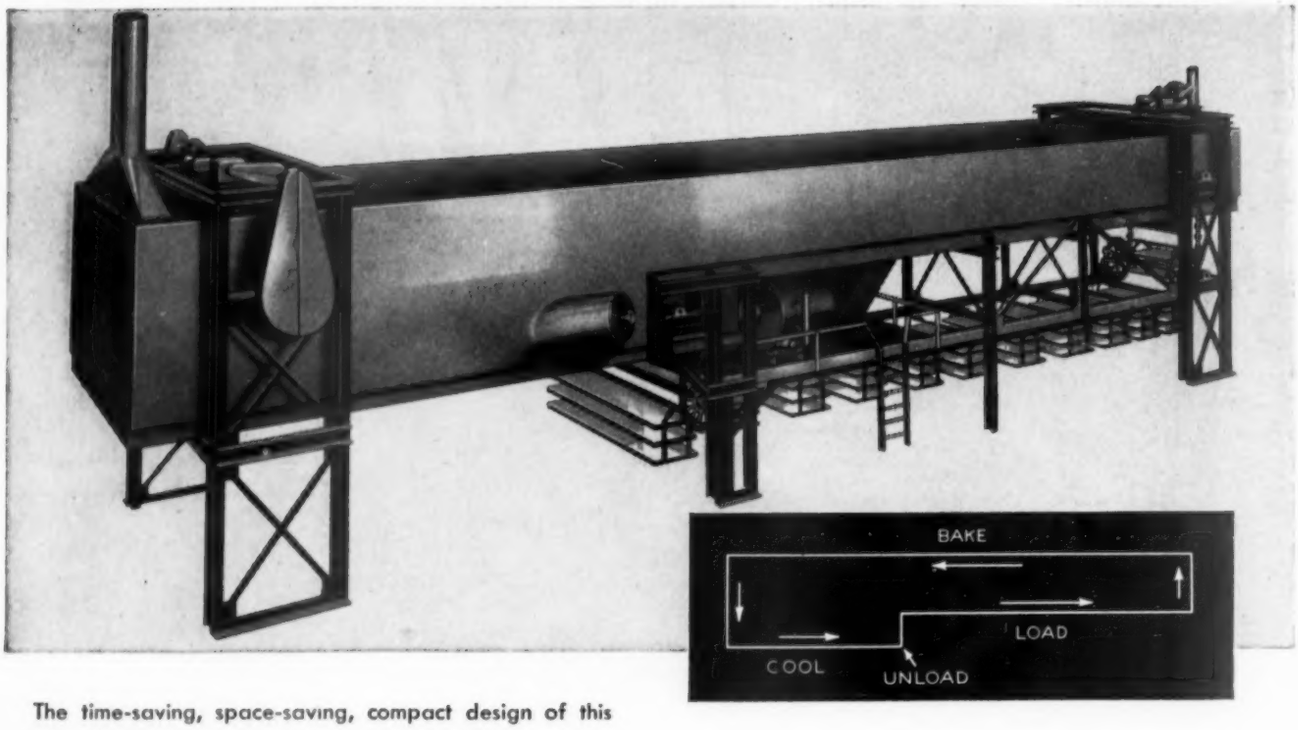
FOUNDRY OVENS OF ALL TYPES

Box Type—Power Lift Doors

Floor Conveyor Types

Filtered Air Supply Systems

MAHON



The time-saving, space-saving, compact design of this new Horizontal Core Oven is characteristic of Young Brothers' Engineering. Into it went the skill and confidence of many years of experience . . . also a thorough knowledge of the job to be done and the production problems involved.

This new core oven can be installed in practically any building without making any major structural changes.

The coremakers are located right next to the oven so that they can load the cores directly on the moving racks thus eliminating the necessity of transporting them on hand trucks or a conveyor from the core room. The location of the coremakers, at the oven, also saves core room space.

The size of the loading racks can be varied and the shelves can be adjusted to accommodate cores of many sizes and shapes.

Besides allowing for the removal of exhaust gases at the point of greatest concentration, the new oven design provides an effective cooling zone for the cores and assures comfortable working conditions for the coremakers.

This New Horizontal Core Oven is Young Brothers' answer to the demand for better core baking equipment. It is YOUR answer to the need for lower production costs and higher operating efficiency.

New HORIZONTAL CORE OVEN . . . . . offers many cost saving advantages!

MEMBER FOUNDRY EQUIPMENT MANUFACTURER'S ASSOCIATION, INC.

YOUNG BROTHERS COMPANY

6508 MACK AVENUE DETROIT 7, MICHIGAN

YB CO ESTABLISHED IN 1896

MELTRITE

Such Preference

MUST BE MERITED!

MORE USED THAN ANY OTHER MERCHANT PIG IRON

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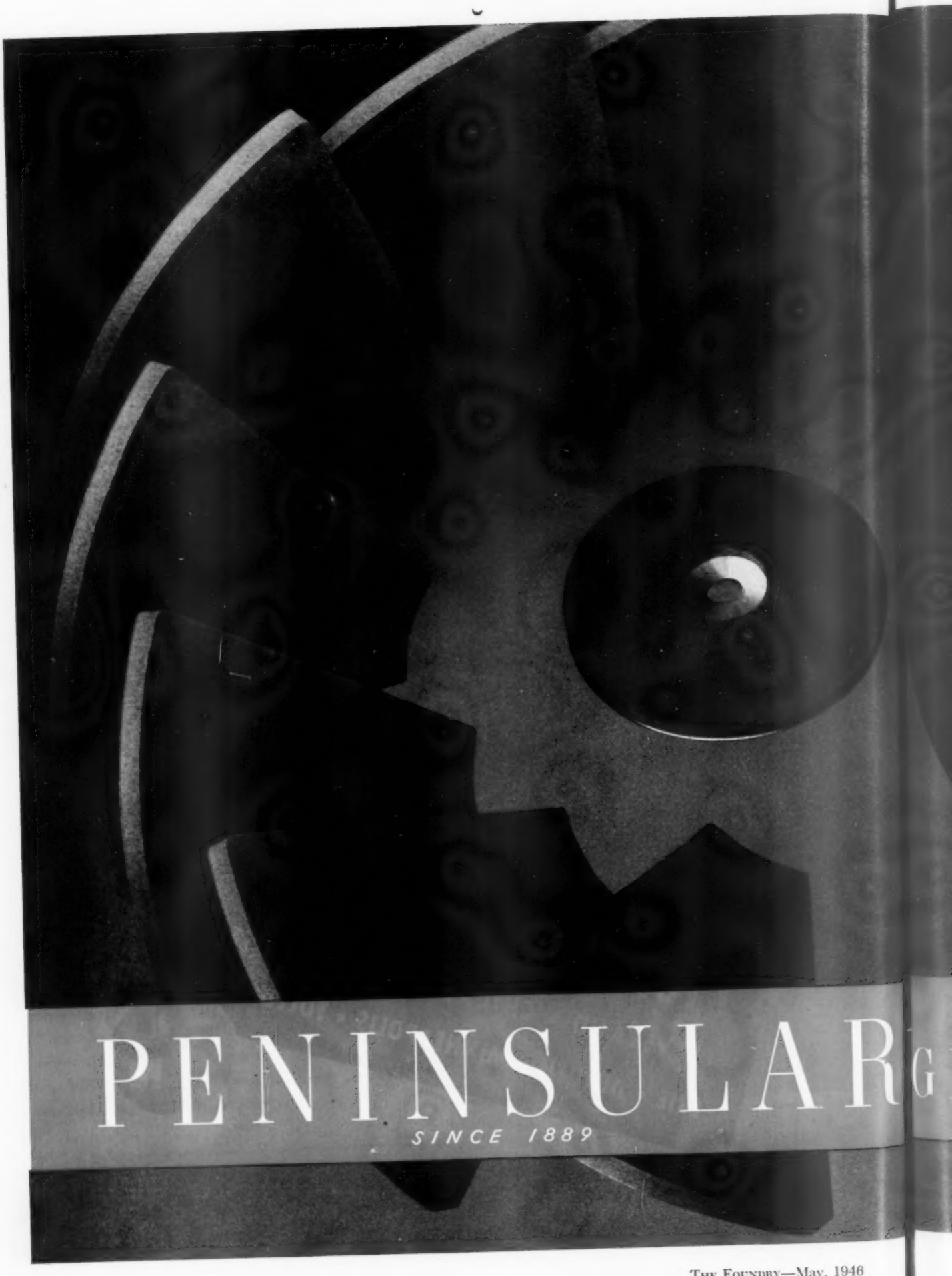
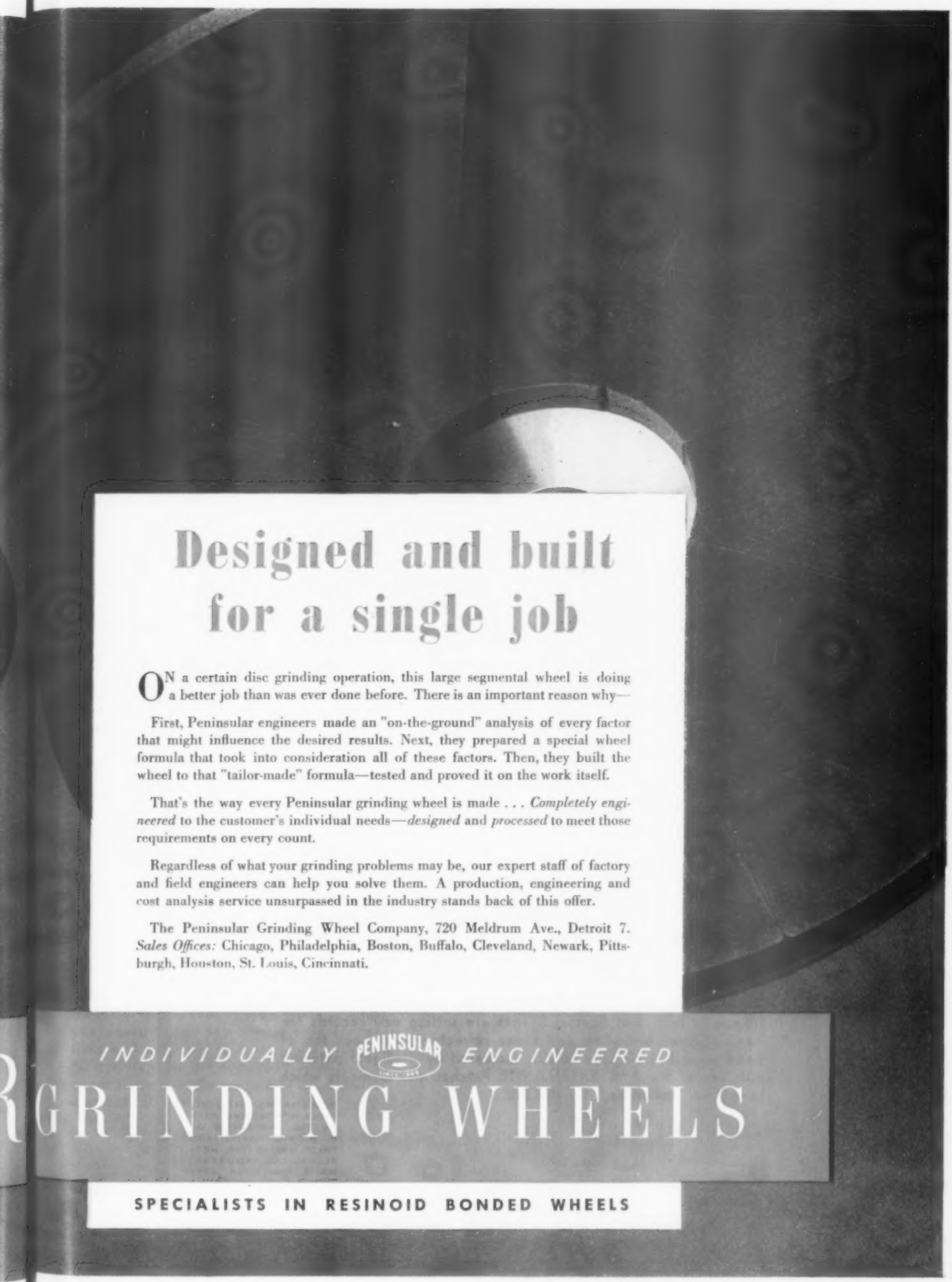
IRON ORE • PIG IRON • COAL • COKE


PENINSULAR
SINCE 1889



Designed and built for a single job

ON a certain disc grinding operation, this large segmental wheel is doing a better job than was ever done before. There is an important reason why—

First, Peninsular engineers made an "on-the-ground" analysis of every factor that might influence the desired results. Next, they prepared a special wheel formula that took into consideration all of these factors. Then, they built the wheel to that "tailor-made" formula—tested and proved it on the work itself.

That's the way every Peninsular grinding wheel is made . . . *Completely engineered* to the customer's individual needs—*designed* and *processed* to meet those requirements on every count.

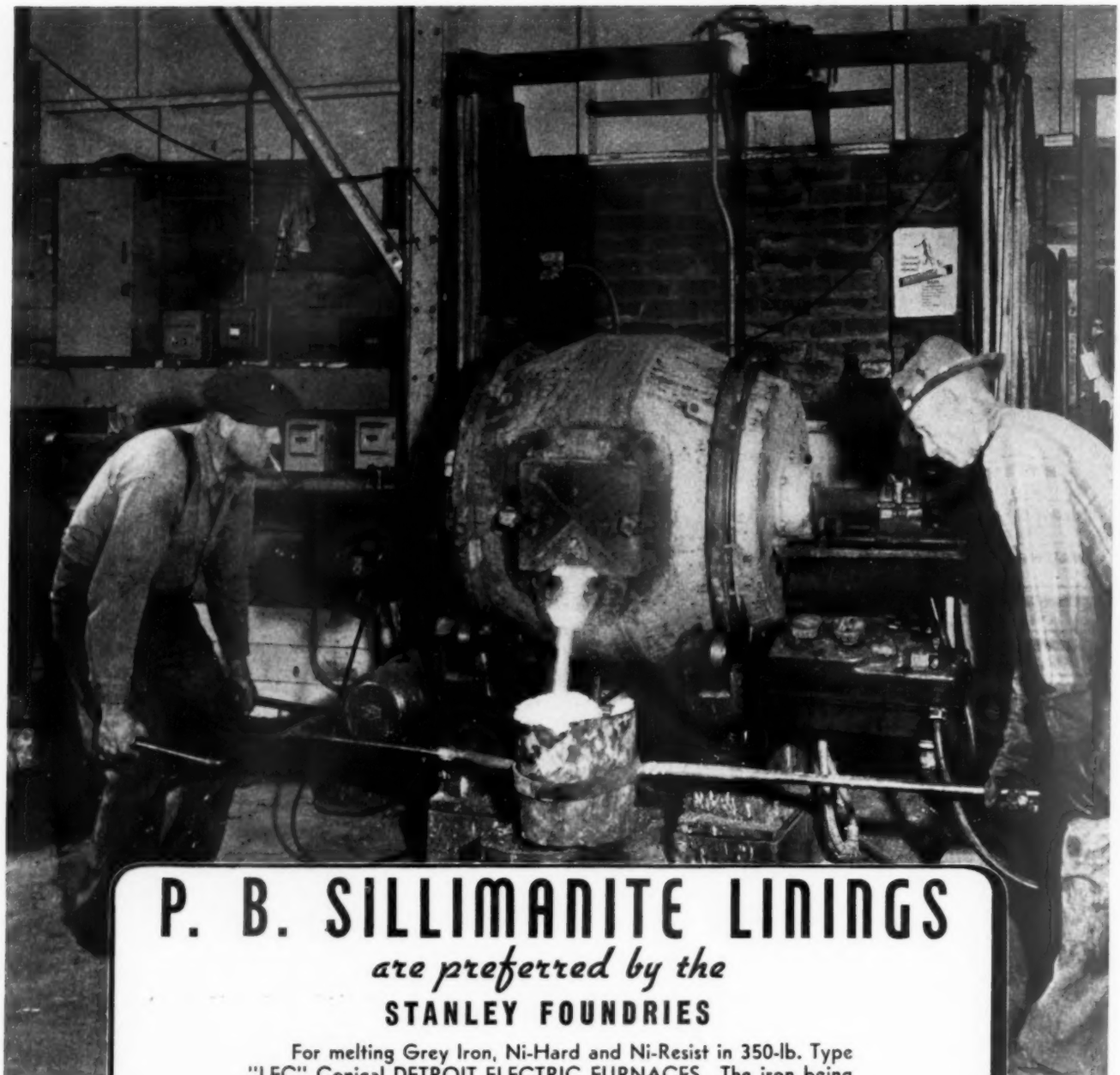
Regardless of what your grinding problems may be, our expert staff of factory and field engineers can help you solve them. A production, engineering and cost analysis service unsurpassed in the industry stands back of this offer.

The Peninsular Grinding Wheel Company, 720 Meldrum Ave., Detroit 7. *Sales Offices:* Chicago, Philadelphia, Boston, Buffalo, Cleveland, Newark, Pittsburgh, Houston, St. Louis, Cincinnati.

INDIVIDUALLY PENINSULAR *ENGINEERED*

GRINDING WHEELS

SPECIALISTS IN RESINOID BONDED WHEELS



P. B. SILLIMANITE LININGS

are preferred by the

STANLEY FOUNDRIES

For melting Grey Iron, Ni-Hard and Ni-Resist in 350-lb. Type "LFC" Conical DETROIT ELECTRIC FURNACES. The iron being poured when this photograph was taken, the 400th heat from this P. B. SILLIMANITE lining, was used for casting special tubes for oil refineries. Jake Ratzloff, furnace operator, takes pride in getting as many as 500 heats of these iron alloys from P. B. SILLIMANITE linings, with minimum patching. Averaging 12 to 13 heats of 700 to 750 lbs. each in 9 hours.

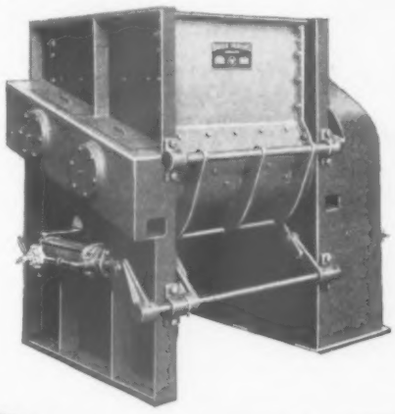
DETROIT ELECTRIC FURNACES which are lined with P. B. Sillimanite Brick and Special Shapes are setting new records for long, efficient operation and lower refractory costs per ton of metal poured. Lining life may be increased by intelligent patching with one of the P. B. SILLIMANITE Patches and Cements which have been 'engineered' for this job.

BULLETIN NO. 311 CONTAINS INTERESTING DATA ON THE PROPERTIES OF P. B. SILLIMANITE AND THEIR USE IN THE METALLURGICAL INDUSTRY. WRITE FOR YOUR COPY TODAY.

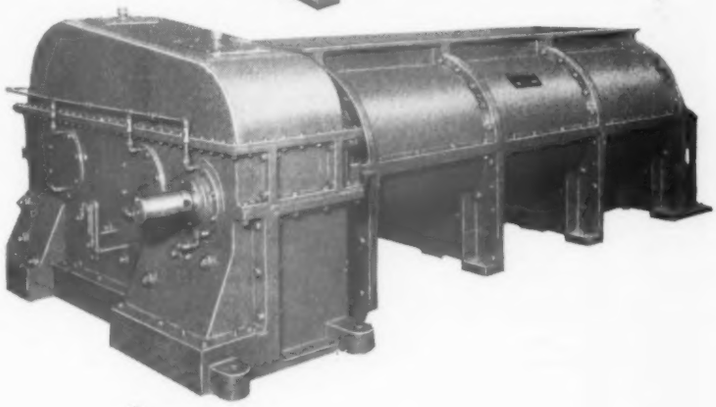
CHAS. TAYLOR SONS Co.

MANUFACTURERS OF REFRACTORIES • CINCINNATI • OHIO • U.S.A.

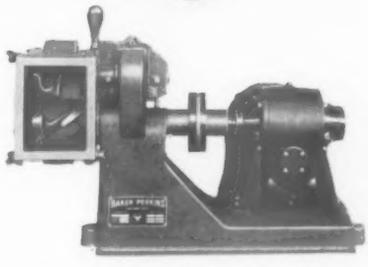
Increase your foundry's efficiency with Baker Perkins equipment



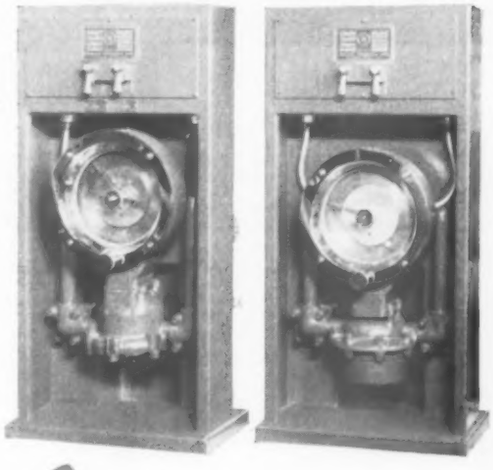
Baker Perkins "Unidor" Core Sand Mixers improve castings and reduce spoilage by improving the character of core sand. Adaptable to, or available with, an air or electrically operated skip hoist, Baker Perkins mixers rub, stir and knead, all in one operation and do not require special aerating attachments. They distribute uniformly a thin layer of bond around each of the sand grains so that you get 100% benefit from the bonds, binders, oils, sea-coal, pitch or other compounds that you use. And because the silica grains are not broken up, the mixed sand has a high degree of permeability.



B-P Continuous Mullers are ideal for throughly and rapidly mixing and tempering moulding sands in big production foundries. Because of the unique blade arrangement the thumbling mass is thoroughly aerated and each grain is coated with the correct proportion of bond. Castings from molds made from sand which has been mulled in a B-P muller have a smooth finish, and help assure a minimum of rejected castings. B-P Continuous Mullers deliver 40 to 120 tons of sand per hour in a continuous, uninterrupted flow and require practically no attention whatsoever.



Baker Perkins Laboratory Core Sand Mixers are the ideal units for plants where the exact condition of the sands and bonds are constantly tested. Capacity 1500 to 2000 grams. Any mixing done in this unit can be duplicated on a production basis in the large B-P Foundry Mixers. B-P Laboratory Core Sand Mixers can help you improve your technical knowledge of foundry practice and help you produce better, more uniform castings with less rejects.



Baker Perkins Liquid Meters automatically and accurately control and measure the amount of binder oil or water flowing directly to each mixer. Once you set the electrically illuminated dials, you can count on the meter giving exactly the amount of liquid you desire. Only two simple pipe connections and a plug-in to a standard 110 volt, 60 cycle circuit are required. Available in capacities to handle up to 600 lbs. Hand or automatically set.

Baker Perkins Inc.

FOUNDRY EQUIPMENT SALES • SAGINAW, MICHIGAN

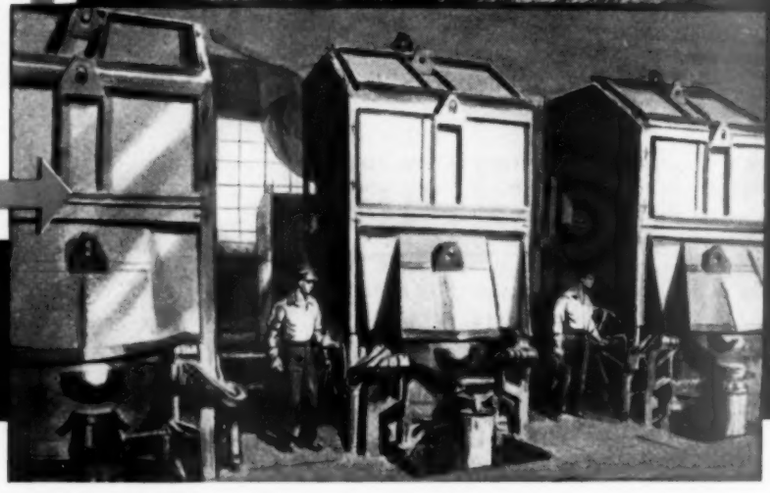
STOP DUST AND FUMES from Putting Your Foundry in the *RED*

BEFORE–drawing (based on actual photograph) shows the furnace room at Titan Metal Mfg. Co.'s Bellefonte, Pa. plant, before the Sturtevant Fume Control system was installed. Foundrymen didn't thrive on their diet of dust, smoke and fumes; machines were clogged up and production costs went sky-high

In one foundry after another (yours, too, perhaps) shake-out, pouring, snagging, tumbling, sand-blasting and other processes set up similar conditions. But you can end them! Here's how:

AFTER

the Sturtevant system put air to work for Titan, dust, fumes and smoke were out! Drawing at left, based on actual photographs in our files, shows how clear the air is now. The equipment takes little space, is easy on the power bill! And Sturtevant design means higher efficiency, lower maintenance costs, less time out for repairs and replacements.



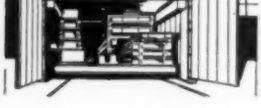
WHAT "AIR AT WORK" CAN MEAN TO YOUR FOUNDRY...

Sturtevant Cupola Blowers — assure smooth, constant pressure supply of air. Compact, simple, sturdy construction; sizes and types for all conditions.

Sturtevant Dust Control — efficient tailor-made systems for production foundries or low-operating-cost equipment for jobbing shops.

Sturtevant Foundry Shake-out Systems — completely control dust and fumes, increase worker efficiency and equipment life, cut down maintenance.

Sturtevant Core Oven Fans —handle dirt, dust-laden air with no loss in efficiency. Shafts are cooled by special "heat-slinger".



Sturtevant Compressors— hold air pressure constant in supplying blast to oil or coke burners. Lifetime efficiency, minimum maintenance, worthwhile power savings.

HEATING • VENTILATING • AIR CONDITIONING

DRYING • DUST AND FUME CONTROL

WHY THIS FAMOUS Sturtevant *Puts Air to Work* TRADE SLOGAN

NOW HAS NEW IMPORTANCE

FOR FOUNDRIES

Sturtevant is now "Putting Air to Work" as a Division of Westinghouse Electric . . . 3 *new advantages!*

BY POOLING RESOURCES with Westinghouse Electric, Sturtevant now offers the most complete line of air handling systems ever available from a *single manufacturing source.* To the Foundry Operator, this means three important new advantages:

1. UNDIVIDED RESPONSIBILITY in dealing with one source for all air handling equipment . . . from Sturtevant Fume Control systems to Westinghouse motors, controls and the new Precipitron* . . . from planning to assembly, final installation and service.

2. IMPARTIAL ENGINEERING HELP because the two organizations together manufacture every component part of the complete system, and in such variety as to be able to recommend—and *assemble*—exactly the right equipment for any given job.

3. COST SAVINGS that come from buying air handling and air cleaning equipment in one complete "package". No extras, no added costs.

The Sturtevant Fume Control system described on the opposite page is typical of a long series of Sturtevant Foundry installations that are giving outstanding service in foundries all over the country. And now Westinghouse rounds out this famous line by the addition of motors, controls and the electronic air cleaner, *Precipitron,** considered one of the most important air cleaning developments of recent years.

A Sturtevant engineer will gladly study your air handling problems, and show you what the Sturtevant-Westinghouse combination can mean to you in higher efficiency, better service and lower cost. Address inquiries to: B. F. Sturtevant Company, Division of Westinghouse Electric, Hyde Park, Boston 36, Mass.

**Trademark registered in U.S.A.*

Sturtevant
Puts Air to Work

B. F. STURTEVANT COMPANY • DIVISION OF
Westinghouse ELECTRIC

PRECIPITRON

MECHANICAL DRAFT

High Speed SMALL

T-4134
A distributing ladle receives molten metal from the tea-pot mixing ladle.

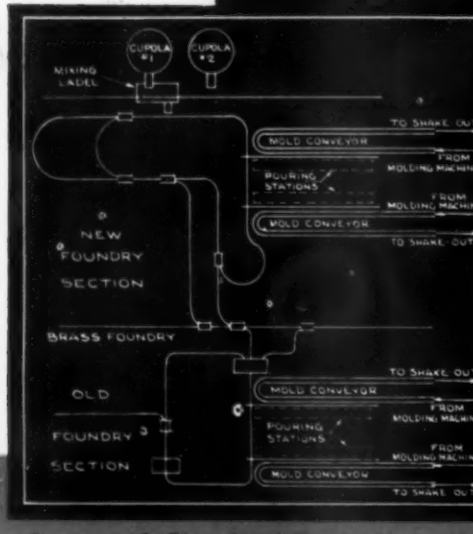
Every Foundry of Every Type and Size Can Profit with CLEVELAND TRAMRAIL

Hundreds of foundries from the smallest to the largest are now enjoying the many advantages that Cleveland Tramrail provides.

Regardless of your problem, if it's handling materials, Cleveland Tramrail can help you. And even if you do not have a problem, you should get the facts on what Cleveland Tramrail can do for you and plan now for the future.

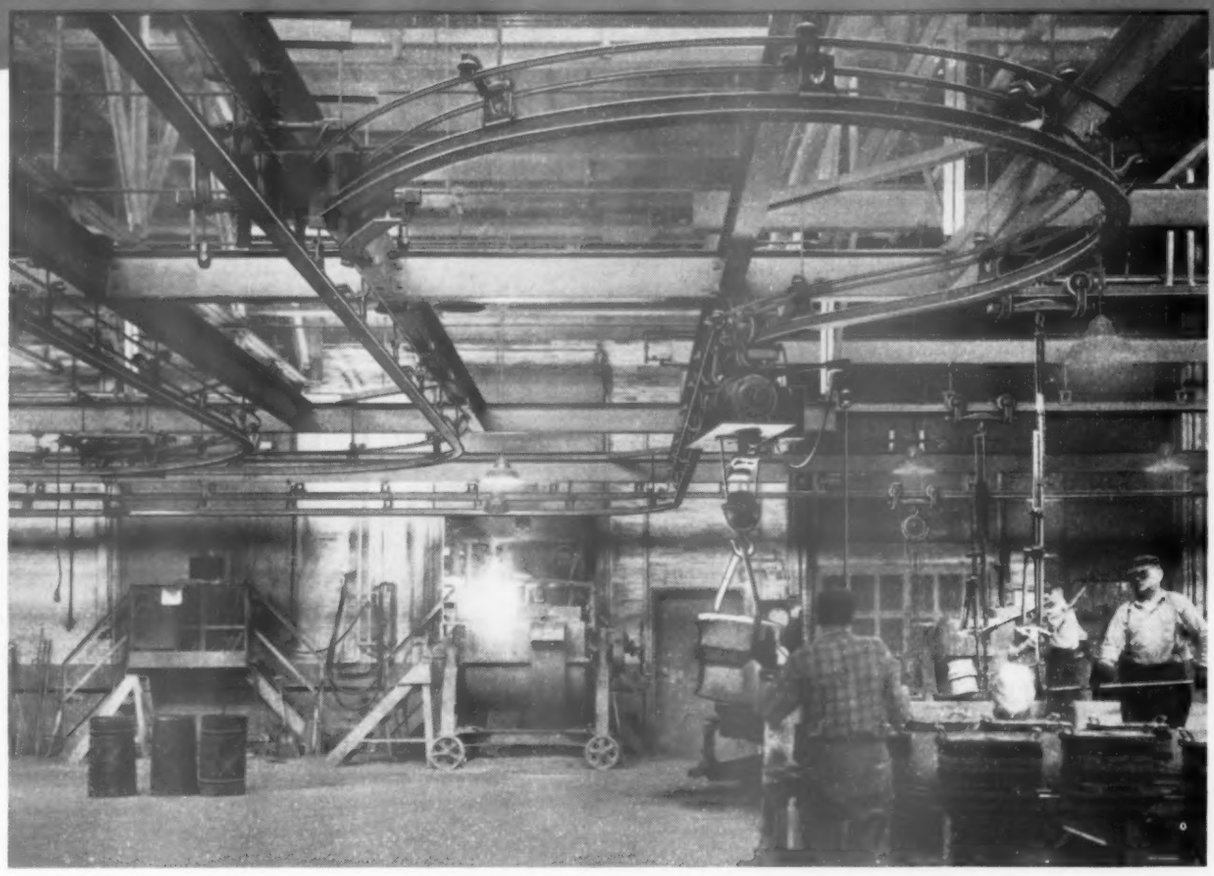
T-4135
The distributing ladle is transported to one of the mold conveyors where the metal is transferred to a pouring ladle. Note both of these ladles ride on hand-propelled overhead Cleveland Tramrail carriers. An electric hoist raises and lowers the distributing ladle. A lever arrangement changes the elevation of the pouring ladle.

T-4136
The molds are poured on the conveyor as they pass this sta Although pouring continues day long at a rapid rate, the no running helter-skelter or cient steps, because molds metal are brought together by efficient conveying metho



Layout of Cleveland Tramrail System

ASTING PRODUCTION



7-4132
View of overhead rail system serving the two mold conveyors in new foundry section. This is only a part of the extensive Cleveland Tramrail system in this modern foundry.

For Tops in Production, Study This Clean, Orderly, Efficient Layout

For the production of small and medium castings, a combination of Cleveland Tramrail equipment and continuous mold conveyors is providing outstanding advantages for an Eastern foundry. Top efficiency is obtained and confusion and lost time reduced to a minimum.

There are four continuous mold conveyors which travel through the molding departments where the molds are received directly from the molding machines. Each conveyor has one man whose sole task is to pour the molds. A second man shifts the weights.

40 tons of grey iron are poured per 9-hour day. The metal is conveyed from the furnace to the pouring stations by the overhead Cleveland Tramrail system. One distributing ladle with operator is required to supply each mold conveyor where the metal is transferred to the small pouring ladles which also ride on tramrail carriers.

This is a high speed production foundry. It is clean and orderly and every detail systematized. Each man has a specific job. Because of the modern facilities provided he handles his work with ease and dispatch. His every step has been carefully planned for maximum efficiency and he cannot deviate from the routine established.

The mold conveyors set the production pace. This is slow enough so that the pourer can fill all molds and have sufficient time to refill his ladle. If for any reason the conveyor is moving too fast, it can be stopped temporarily.

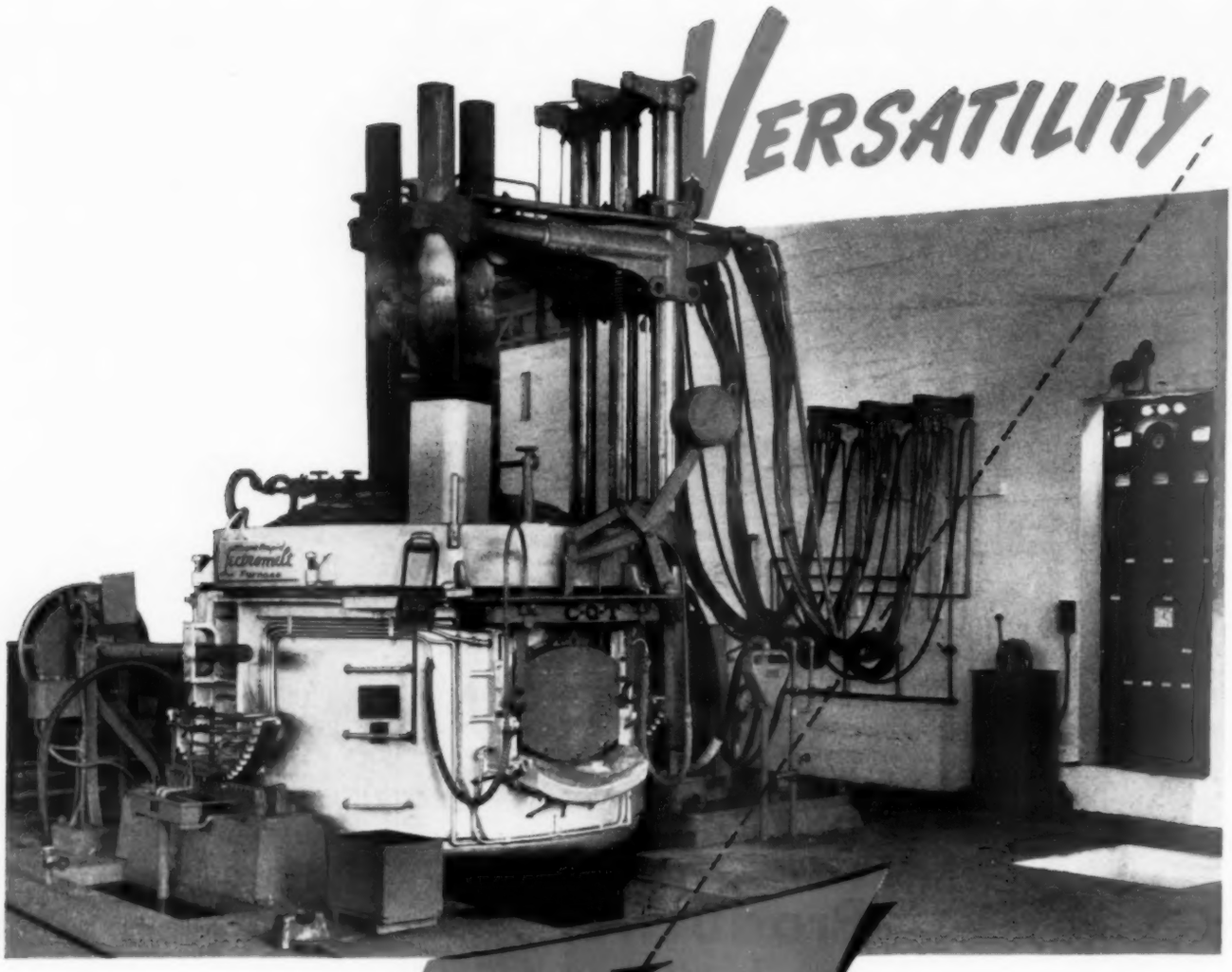
Cleveland Tramrail equipment was originally installed in 1928 to serve the first two continuous mold conveyors put into operation. Because of its satisfactory performance Cleveland Tramrail was again chosen to serve two additional conveyors when installed in 1941.

CLEVELAND TRAMRAIL

DIVISION OF

THE CLEVELAND CRANE & ENGINEERING CO.

1155 EAST 283 RD. ST. WICKLIFFE, OHIO.



MOORE RAPID

A Lectromelt FEATURE

FURNACES

• The versatility of the Lectromelt Furnace in economically melting either large or small heats is of great advantage where the user requires a wide variety of castings. The entire heat may be tapped or part of the heat may be tapped and the analysis of the remainder altered as desired. This means economy of power, time, and metal.

Another phase of the Lectromelt versatility is that you may use either large bulky scrap or light fluffy scrap. In the production of quality gray and malleable iron it is possible to follow any of three procedures . . . Batch type cold melting, continuous cold melting type, or duplexing operations on molten metal. Steel and iron may be melted in the same furnace—in alternate heats if desired. This versatility means economy of operation and the production of the exact quality metal.

Lectromelt top charge furnaces are available in capacities ranging from 100 tons down to 250 pounds.

Pittsburgh Lectromelt Furnace Corporation

PITTSBURGH 30, PENNA.

VANCORAM BRAND

Visit our exhibit
Booth No. 1703
Foundry Show
Cleveland, May 6-10

Products for the Iron and Steel Industries

PRODUCT	NOMINAL COMPOSITION	APPLICATIONS
ALSIFER	Aluminum.....20% Silicon.....40% Iron.....40%	Used principally as a steel deoxidizer and for grain size control.
FERRO CHROMIUM High Carbon Grade	Chromium...66-70% Carbon..... 4-6%	For wrought constructional steels and steel and iron castings.
Iron Foundry Grade	Chromium...62-66% Carbon.....4-6% Silicon.....6-9%	For alloyed cast irons. Readily soluble as a ladle addition at the lower temperatures of cast iron.
Low Carbon Grades	Chromium...67-72% Carbon...06%, .10%, .15%, .20%, .50%, 1.00% and 2.00% max.	For low carbon chromium steels, especially those with high chromium content, such as stainless and heat-resistant types.
FERRO SILICON 25-30% Grade	Silicon.....25-30%	Deoxidizer for open hearth steels; also for high silicon, corrosion-resistant iron castings.
50% Grade	Silicon.....47-52%	Used as a deoxidizer and for the addition of silicon to high silicon steels, for springs, electrical sheets, etc. Pulverized form used as ladle addition to cast irons for silicon content and graphitization control.
75% Grade	Silicon.....74-79%	For high content silicon steels, such as spring steels, sheets and forgings of high magnetic qualities for electrical apparatus.
High Silicon Grades 80-85% 85-90% 90-95%	 Silicon.....80-84.9% Silicon.....85-89.9% Silicon.....90-95%	For high content silicon steels where small ladle additions are used for required silicon content. Also for manufacture of hydrogen by reaction with caustic soda and production of magnesium by the Pidgeon process.
FERRO TITANIUM High Carbon Grade	Titanium....15-18% Carbon.....6-8%	Final ladle addition to control "rimming" action and to clean effervescing steel. Final deoxidizer and scavenger for steel castings and fully killed ingot steels.
Medium Carbon Grade	Titanium....17-21% Carbon.....3-4.50%	Often preferred to the High Carbon Grade as a final ladle addition to very low carbon rimming or effervescing steels.
Low Carbon Grades 20-25% Ti Grade	Titanium....20-25% Carbon..Max. 0.10% Silicon.....Max. 4% Aluminum Max. 3.50%	As a carbide stabilizer in high chromium corrosion resistant steels of extremely low aluminum content. Deoxidizer for some casting and forging steels.
40% Ti Grade	Titanium....38-43% Carbon..Max. 0.10% Silicon.....Max. 4% Aluminum..Max. 8%	As a carbide stabilizer in high chromium corrosion resistant steels, where smaller ladle additions are desired and extremely low aluminum content is not essential.
VANADIUM METAL 90% Grade	Vanadium....91.15% Aluminum.....3.87% Silicon.....0.50% Carbon.....0.17%	For special iron-free (nonferrous) or low iron alloys or low impurity ferrous alloys.
95% Grade	Vanadium....95.18% Aluminum.....2.00% Silicon.....0.27% Carbon.....0.15%	Principally for research on the properties of pure alloys.

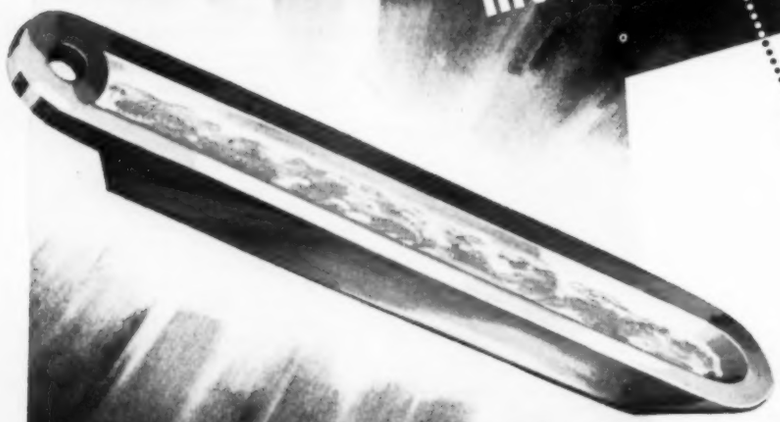
PRODUCT	NOMINAL COMPOSITION	APPLICATIONS
FERRO VANADIUM Grade "A" (Open Hearth)	Vanadium...35-40% Silicon....Max. 12% Carbon..Max. 3.50%	For low percentage vanadium content of rolled, forged or cast constructional steels. Also used in vanadium cast irons.
Grade "B" (Crucible)	Vanadium...35-45% Silicon..Max. 3.50% Carbon..Max. 0.50%	For tool steels and special steels containing high percentages of vanadium, in which required limits for carbon and silicon are narrow
Grade "C" (Primos)	Vanadium...35-45% Silicon..Max. 1.25% Carbon..Max. 0.20%	For tool steels and special steels requiring high percentages of vanadium and exceptionally low carbon and silicon content.
Special Grades	Vanadium...50-55% 60-65% 70-80% Silicon.....Low Carbon.....Low	For special applications and uses requiring large vanadium additions.
VANADIUM PENTOXIDE Technical Grade Fused Form	V_2O_5.....90%	A source of vanadium in basic electric furnace steels. A base for numerous chemical compounds.
Technical Grade Air Dried Form	V_2O_5.....85%	A base for preparation of numerous chemical compounds, such as catalysts, etc.
GRAINAL ALLOYS Vanadium Grainal No. 1	Vanadium....25.00% Aluminum....10.00% Titanium.....15.00% Boron.....0.20%	Practical and economical intensifiers for controlling and increasing the capacity of steels to harden, and for improving other important engineering and physical properties.
Vanadium Grainal No. 6	Vanadium....13.00% Aluminum....12.00% Titanium.....20.00% Boron.....0.20%	See above.
Grainal No. 79	Aluminum....13.00% Titanium.....20.00% Zirconium.....4.00% Manganese....8.00% Boron.....0.50% Silicon.....5.00%	See above.
GRAPHIDOX No. 4	Silicon.....45-50% Titanium.....9-11% Calcium..... 5-8%	New alloy for the graphitization of iron; ladle treatment insures iron with normal graphite, free from dendritic structure; reduces chill; efficient inoculant in the production of high strength irons.
V-FOUNDRY ALLOYS V-5 Grade	Chromium....38-42% Silicon.....14-16% Manganese....8-11%	Used in cast irons as a ladle addition. Reduces chill, promotes uniformity of structure, increases strength and hardness.
V-7 Grade	Chromium....28-32% Silicon.....15-21% Manganese...14-16%	See above.
BRIQUETTES Ferro Chromium	Hexagonal in shape. Weighs approximately 3¾ pounds and contains 2 pounds of chromium.	A practical and convenient form for adding ferro alloys to the cupola.
Ferro Silicon	Two sizes available, both cylindrical in form, one containing 1 pound of silicon; the other 2 pounds of silicon.	See above.

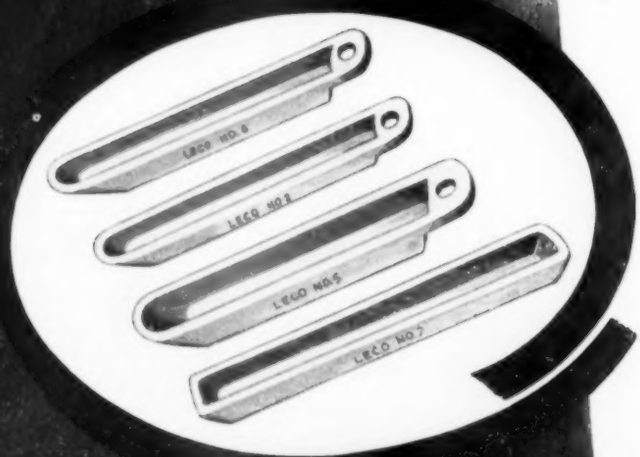
VANADIUM CORPORATION OF AMERICA

420 LEXINGTON AVENUE, NEW YORK 17, N. Y. · DETROIT · CHICAGO · CLEVELAND · PITTSBURGH

The trend is toward

HIGHER COMBUSTION TEMPERATURES





● **LECO COMBUSTION BOATS**

have been designed to withstand temperatures up to 2700° Fahrenheit.

In addition they give you these features:

- Fast preheating because of light weight.
- Resist heat shock to permit reuse of the boat for repeated combustions.
- Sulphur free.
- Carbon free, except as contaminated from handling.

● **VERY LOW COST**

There is a Leco Combustion Boat to suit your every requirement. Large stocks of standard shapes and sizes are maintained to assure immediate delivery. Special shapes may be furnished upon request.

Compare the Leco boat with any other on the market. We will furnish you free samples for this purpose.

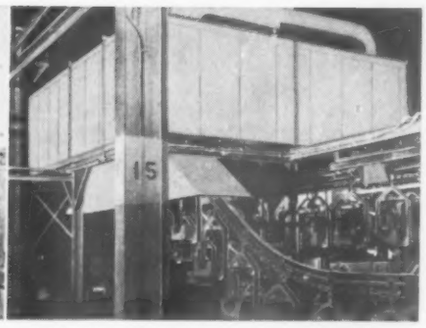
LABORATORY EQUIPMENT CORPORATION

BENTON HARBOR, MICHIGAN

INVEST NOW

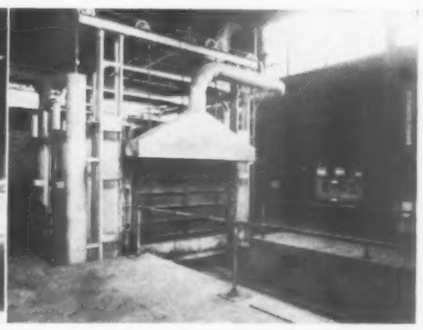
In More Uniform • Faster Heating at Lower Cost-

Gehnrich mold drying oven, equipped with power-operated lift doors; heats a gross load of 150 tons; recirculation heated uniformly (note heat distribution ducts) from an oil-fired heater built integrally with rear oven wall.

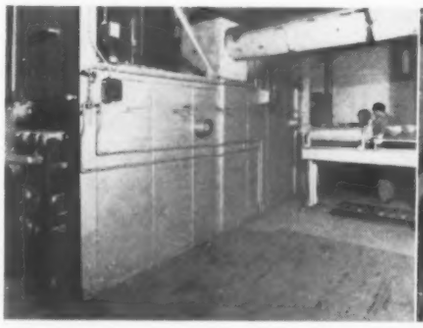


Gehnrich continuous core spray drying oven, for 4-pass counterflow, 200 ft. travel of work on racks; heated by gas-fired, external air heaters and full length recirculation system; oven mounted above floor, saving useful floor space.

Rockwell gas-fired, pusher-tray furnace for annealing large rear axle housing castings; pusher and puller mechanisms and furnace doors interlocked and operated in automatic time cycle.



Rockwell car bottom type, oil-fired furnace with bridge wall firing, providing uniform heat distribution to heavy load, without direct flame impingement on the work.



Gehnrich oven for drying refractory molds and melting out wax investments in precision casting; heated by air from the mold heating furnace, shown at right; trucks moved by air cylinder.

Rockwell gas-fired furnace for preheating (at 1100° F.) and heating (at 1400° F.) refractory molds and castings; work moves by air cylinder pusher; work being removed to put into cooling station at left.

CONVERT Inefficient Baking, Drying and Heat Treating to Improved Operation with GEHNRICH OVENS AND ROCKWELL FURNACES

In practically every foundry heating operation from baking cores in small pull-drawer or truck ovens, to heat treating of aluminum or magnesium castings in batch or continuous conveyor ovens through crucible melting of non-ferrous metals and final annealing of castings of all sizes and quantities in car type or continuous furnaces, you'll find it wise to depend on the 57 years' experience of Rockwell-Gehnrich engineering.

Every foundry heating problem is individually treated and solved on the basis of improved heat processing for better production economy. You'll find that applied—as have hundreds of foundries everywhere—whether you need a cabinet oven or a large pusher type or continuous conveyor oven or furnace.

Here are a number of interesting bulletins on how Gehnrich Ovens and Rockwell Furnaces can help your foundry practice.

THEY'RE FREE — WRITE

W. S. ROCKWELL COMPANY
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Please send me the following:

- ☐ Gehnrich Foundry Ovens.
- ☐ Gehnrich Ovens for Metal Finishing.
- ☐ Rockwell Pusher Type Furnaces.
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- ☐ Rockwell Conveyor Furnaces.
- ☐ Rockwell Oven Furnaces.
- ☐ Rockwell Crucible Melting Furnaces.

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Company_____

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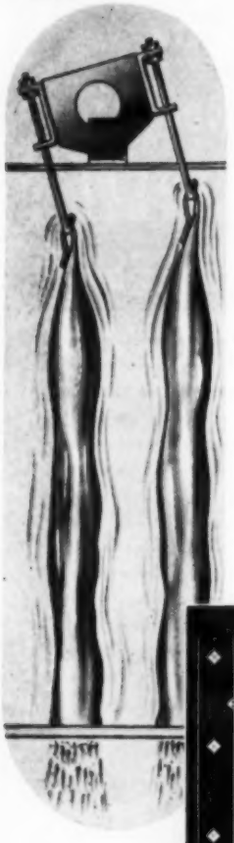
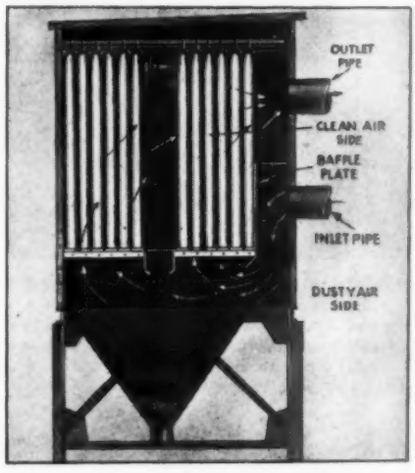
Shaking IS THE EFFICIENT WAY TO CLEAN A *cloth type* DUST COLLECTOR

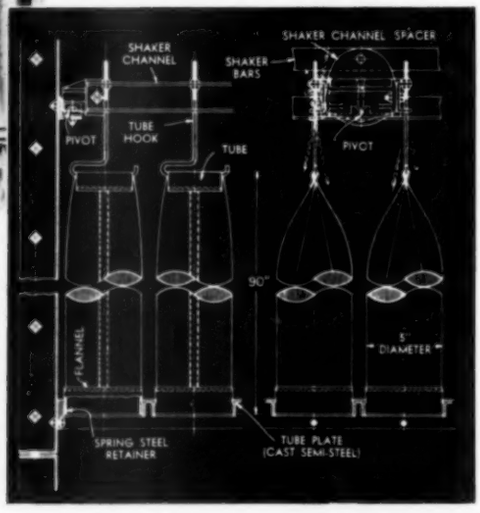




The *effective* removal of accumulated dust from the filters of cloth type dust collectors results in lower operating resistance, longer cloth life, and a direct saving in horse power.

Here are a few of the reasons why the "Dustube" shaking method cleans filter cloth so quickly and effectively:

1. Shakeout is done only when the filter tubes are deflated, limp, and completely subject to the whipping motion imparted by the shaker. There is no "beating" to abrade the cloth. The tubes are suspended in such a manner that they are subjected to a combined vertical and horizontal movement. This causes the tubes to flex from normal circular shape, and effectively breaks up any dust cake. This action occurs the full length of the tube. "Dustubes" are never under tension.



How the shaking action is imparted to the filter tubes in a Dustube.

2. Since each filter tube is an independent cell the dust precipitated by shaking falls immediately into a storage hopper—it is not deposited on other dust cells which may be located in line underneath. The effect of sifting dust from one tier of filters downward to another multiplies the work required in shaking, causes more cloth wear, and increases power requirements.

3. The shaking mechanism of the "Dustube" is located on the clean air side where it is not subjected to the abrasive wear of dust.

4. Because of the efficient Dustube method of shaking there is a more perfect cleaning of the cloth. For that reason shaking periods are shorter and less frequent. In most cases it is not necessary to operate the shaker longer than two minutes.

For the complete story on all the advantages of Dustube Dust Collectors write for Catalog No. 72.

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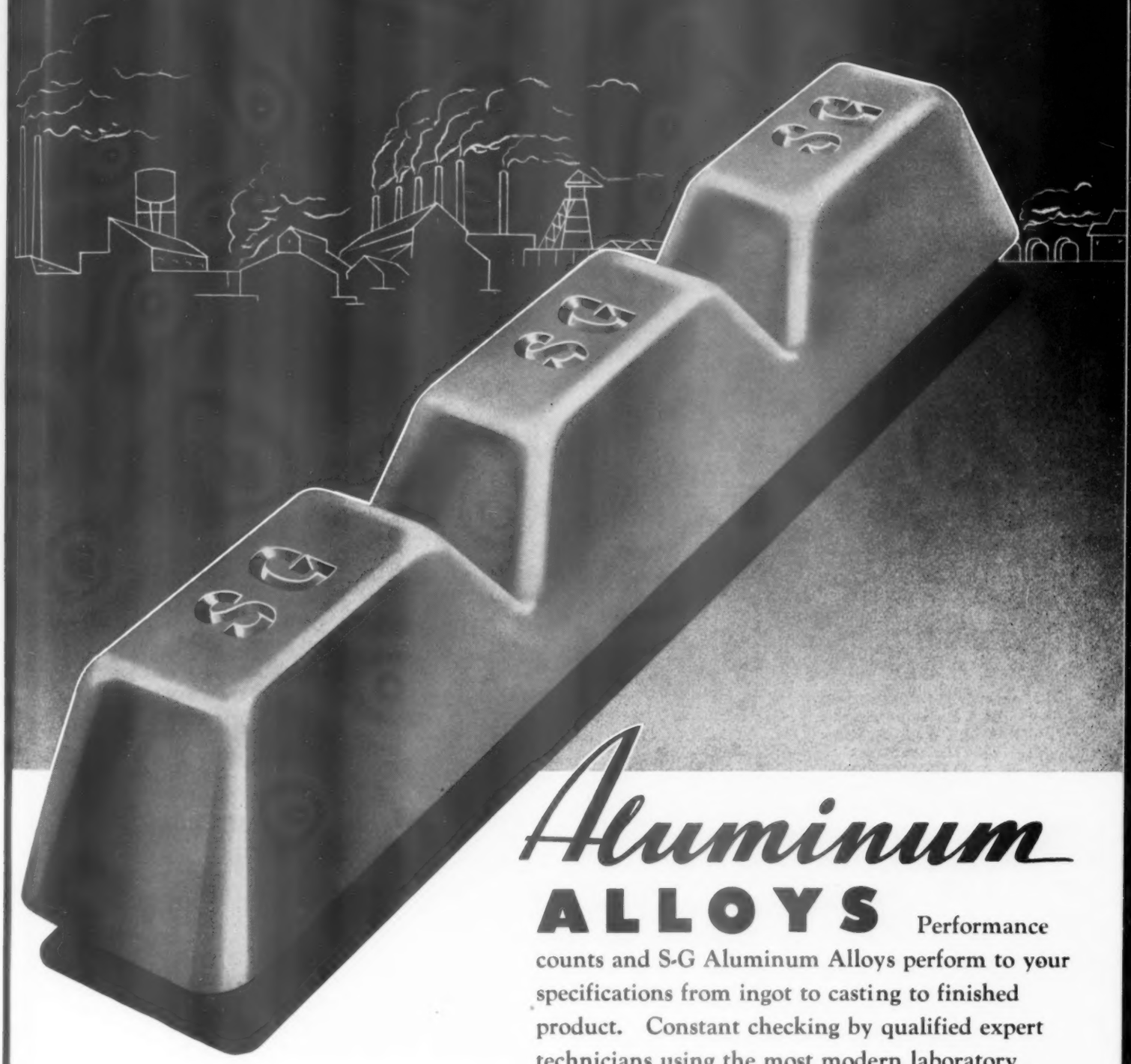
FOUNDRY EQUIPMENT CO.
503 SOUTH BYRKIT ST. MISHAWAKA, IND.

dustube
DUST COLLECTORS

for PERFORMANCE plus



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Performance counts and S-G Aluminum Alloys perform to your specifications from ingot to casting to finished product. Constant checking by qualified expert technicians using the most modern laboratory equipment available, assures the plus performance that comes from the use of quality alloys of uniform composition.

Specify S-G Aluminum Alloy Ingot for Performance Plus

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PATTERN PLATES AND COPE AND DRAG BOARDS

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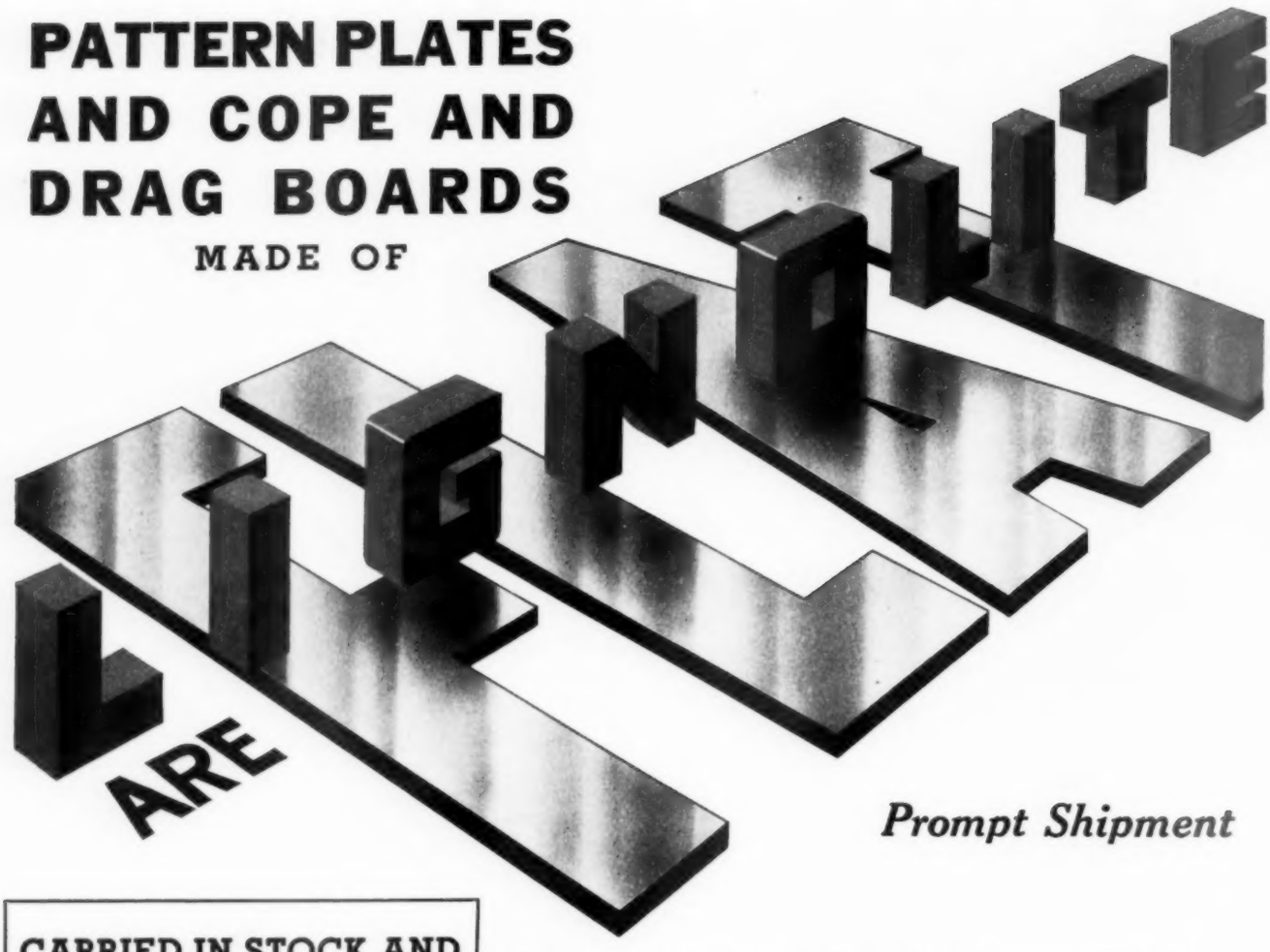

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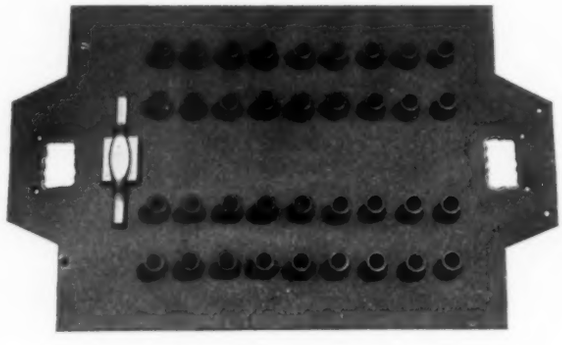
● They stay flat because LIGNOLITE has high transverse strength and resistance to deflection. It is impervious to moisture and does not warp from contact with wet sand or high humidity. LIGNOLITE is half the weight of aluminum, is abrasion proof, of uniform caliper, and may be easily machined, sawed, drilled, tapped. Available in all flask sizes 7/16″ to 2″ thick or in sheets for own cutting. Write for sample and complete information.



Mounted LIGNOLITE Pattern Plate

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CHEMICAL DIVISION **ROTHSCHILD, WISCONSIN**

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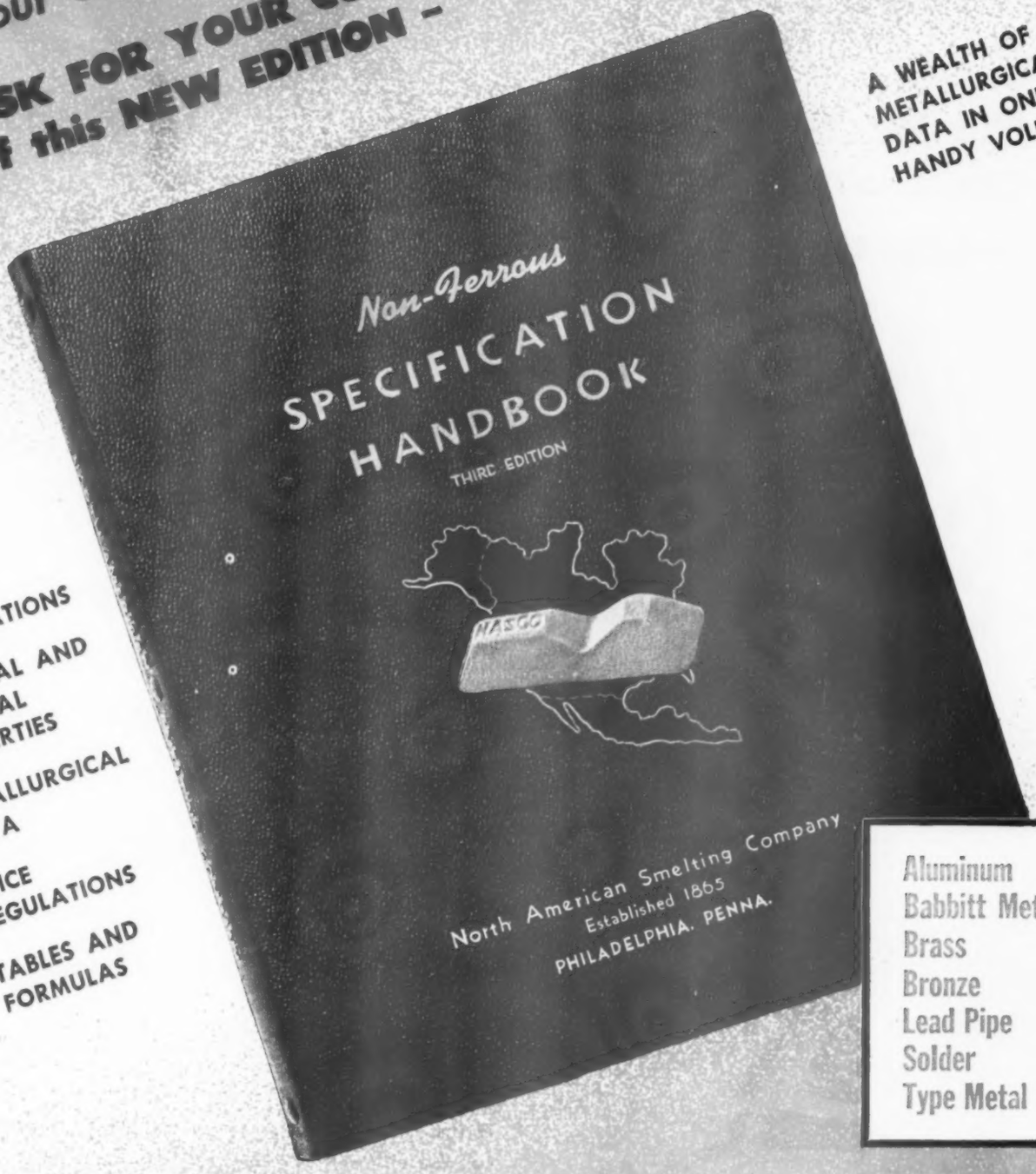
A WEALTH OF METALLURGICAL DATA IN ONE HANDY VOLUME



- SPECIFICATIONS
- CHEMICAL AND PHYSICAL PROPERTIES
- METALLURGICAL DATA
- PRICE REGULATIONS
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AO Spats

The newly designed AO 4903CL Spat offers ideal protection for the foundry worker's ankle and instep. It is made from chrome leather, specially tanned to resist heat and hot metal splashes. (May also be obtained in asbestos or fire-resisting duck with chrome leather flare over instep.) May be quickly adjusted or released.

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AT THE FOUNDRY SHOW — NORTON EXHIBIT #1136,1239.

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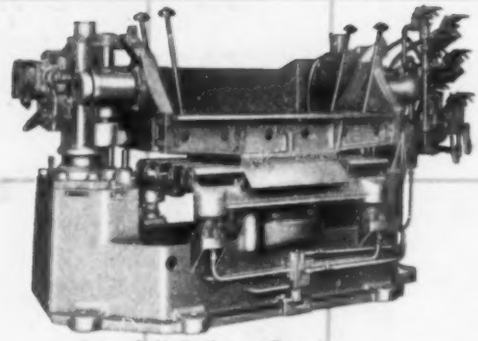
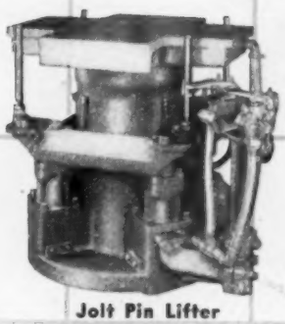


Jolt Rollover Draw
Available in 6 sizes



Jolt Pin Lifter
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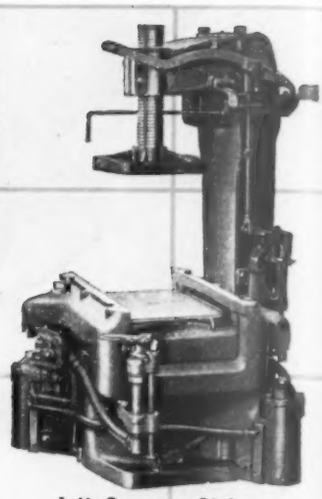
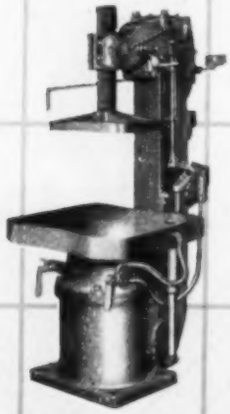
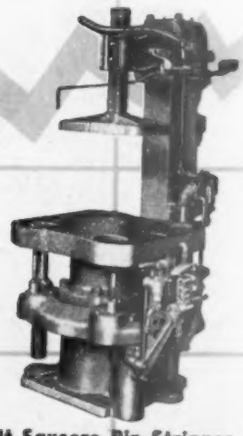


Jolt Squeeze Stripper
Arm Type

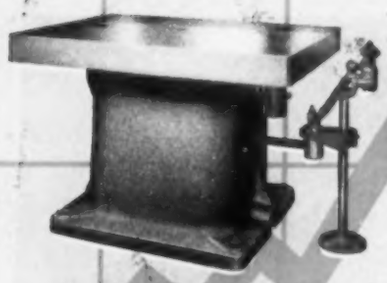


Jolt Squeezer — Stationary Type
14" and 16" Piston Sizes

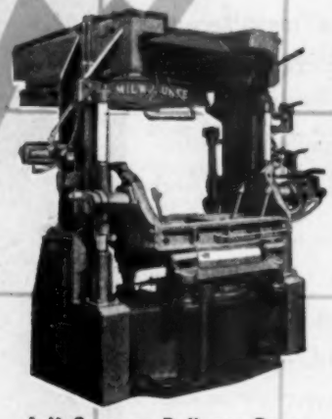
Jolt Squeezer — Portable Type
10" and 12" Piston Sizes



Jolt Squeeze Pin Stripper



Plain Jolt
Made in All Sizes



Jolt Squeeze Rollover Draw

Core Grinder

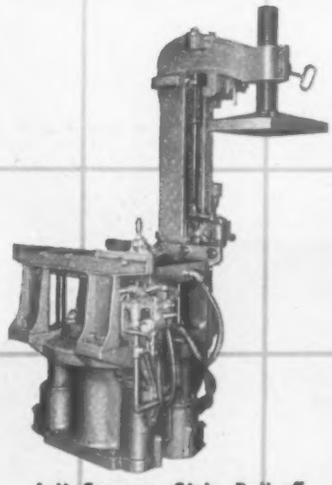
MILWAUKEE

MANUFACTURERS OF MOLDING MACHINES AND BRIQUETTING PRESSES

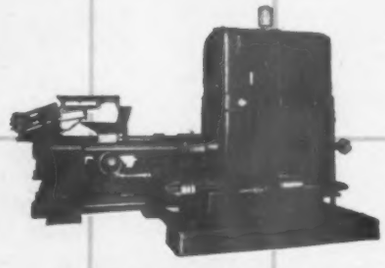
WITH MILWAUKEE MOLDERS

OCTOBER NOVEMBER DECEMBER

Jolt Squeeze Stripper
Car Type



Jolt Squeeze Strip Roll-off
Available in 6 sizes



Hydraulic Briquetting Press

THERE'S A MODERN, HIGH-SPEED MILWAUKEE MOLDER FOR EVERY MOLDING REQUIREMENT

The lid is off!! Now, "sky is the limit" as far as foundry production is concerned. For those new, streamlined Milwaukee Machines enable you to step up mold production to an amazing degree. They are designed to modernize molding methods, speed up the job and at the same time retain the highest standards of quality.

In the complete MILWAUKEE line, there's a model to meet every molding requirement. And every machine is designed and built to take hard, everyday punishment. Steel castings and alloy steels are used where stress is applied. Close-grained, high tensile grey iron is used wherever wear occurs. Instead of links and levers, rigid integral members are employed for alignment. Hardened pins and bushings serve as guides. Correct lubrication is provided. All parts are accurately machined to close tolerances. Adjustments are very accessible and easy to make.

Call in a MILWAUKEE Foundry Engineer

Every engineer at Milwaukee Foundry Equipment Co. is a practical, seasoned foundryman, familiar with all phases of the industry (pattern making, foundry engineering, foundry operation, etc.) This broad experience enables him to study your molding and core making problems intelligently, and arrive at a solution that is both practical and economical.

Foundry Equipment Co.

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You will see things

...when the curtain goes

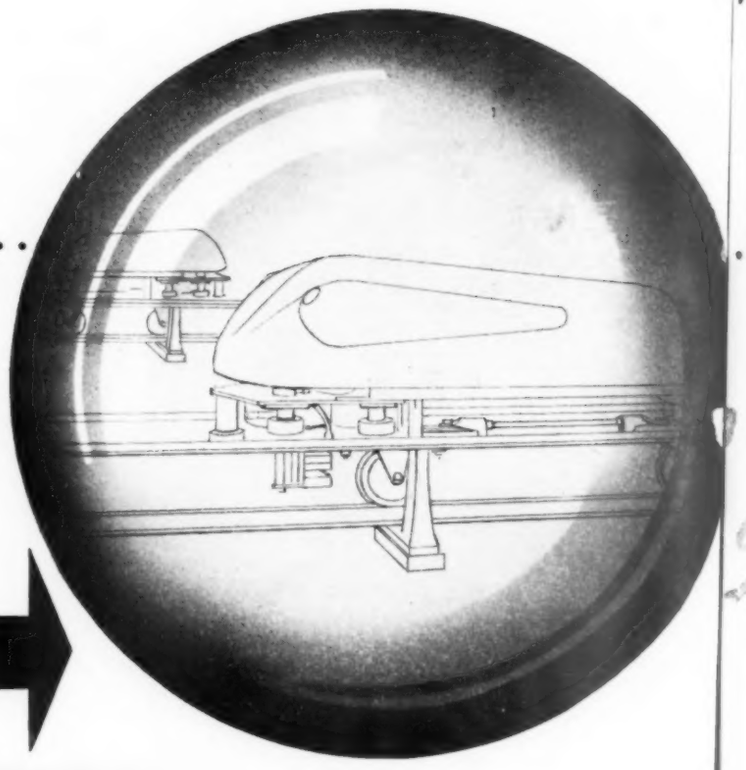
THE FOUNDRY INDUSTRY will attend its "biggest show" in Clevela[nd] help it visualize more clearly what *is* ahead—to see, and learn ev[ery] thing it can that may be applied to the solution of some rug[ged] problems it has to meet.

Men of the Industry will see some very interesting things at Clevelan[d] Foundry Show. Many new products of foundry equipment manufacturers they will discover, offer new ways to reduce casting costs, improve quality and increase the efficiency of labor. These are the most important factors in every foundry's future—they can largely be developed from new methods machines and equipment . . . for example:

At the National exhibit foundrymen will see new National products that were designed and built to help the Foundry meet and solve its problems. If you visit the show look these new products over carefully—you will find them to be, like all equipment engineered by National practical, sound and backed by 35 years of service and experience in the Foundry Industry

..... You'll see .....

.... You'll see .....



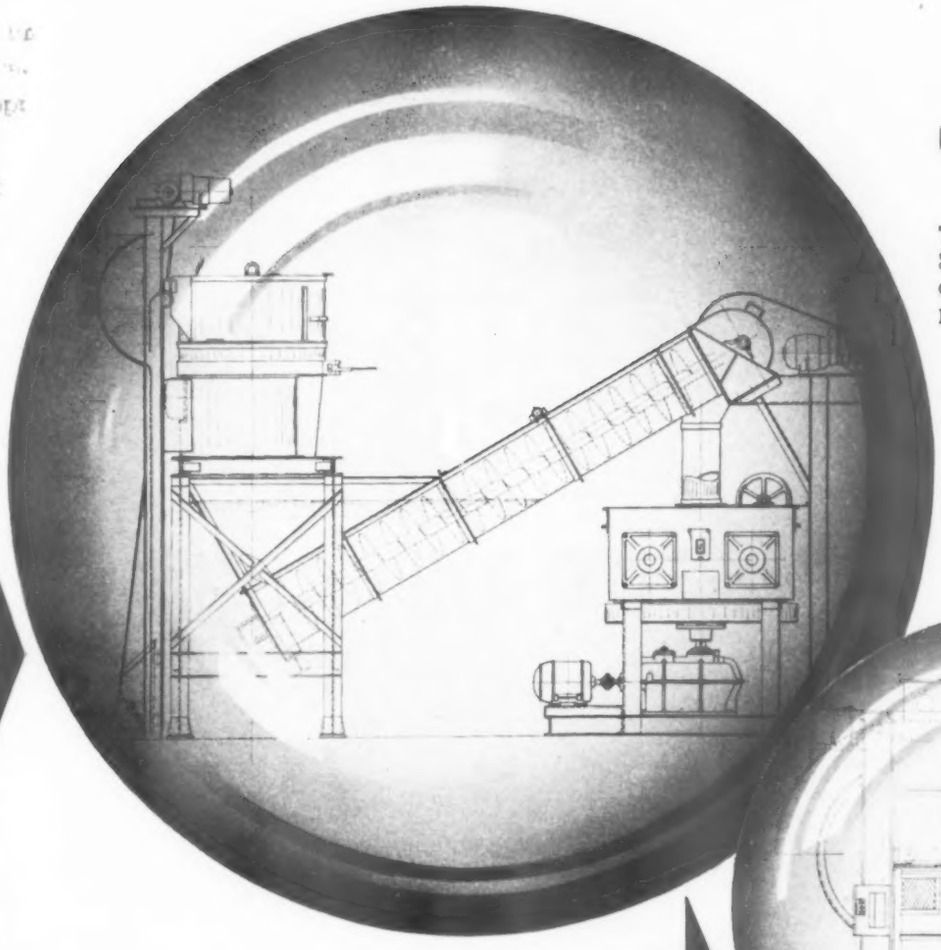
..... You'll see ..

NATIONAL
MONO-ROLL MOLD CONVEYOR

Production efficiency reaches new standards with modern handling like the National mold conveying system—it will be in the National Exhibit.

...old your foundry's future...

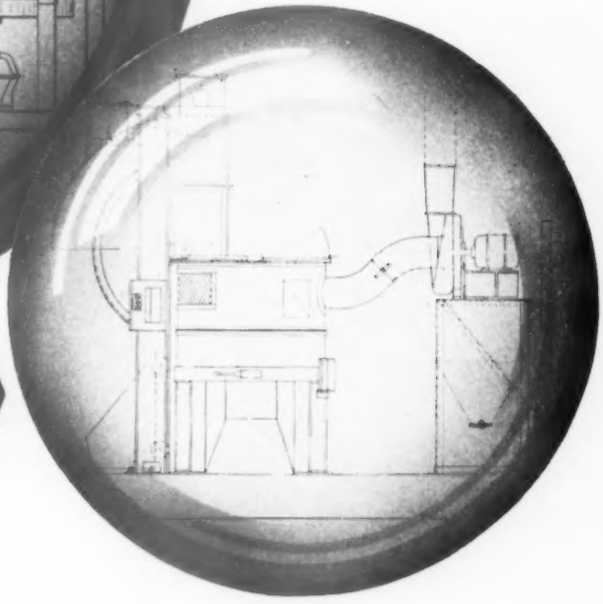
...up at Cleveland!



NATIONAL SAND RECOVERY SYSTEM

RECOVERS 85% used sand

There is nothing like this new National System — it completely cleans used core and molding sand in 2 stage processing — scrubbing and ignition. Don't miss it!



NATIONAL 1-H SAND SYSTEM

A compact unit for small foundries or special departments of large foundries. Look over this long-needed simple sand preparing system—you will like it!

You will see.....

...them at Booth 1324

● There will be other important units shown too—like the National No. 2 Simpson Mixer automatically operated. You certainly want to see them—so be sure to stop in to visit us early.

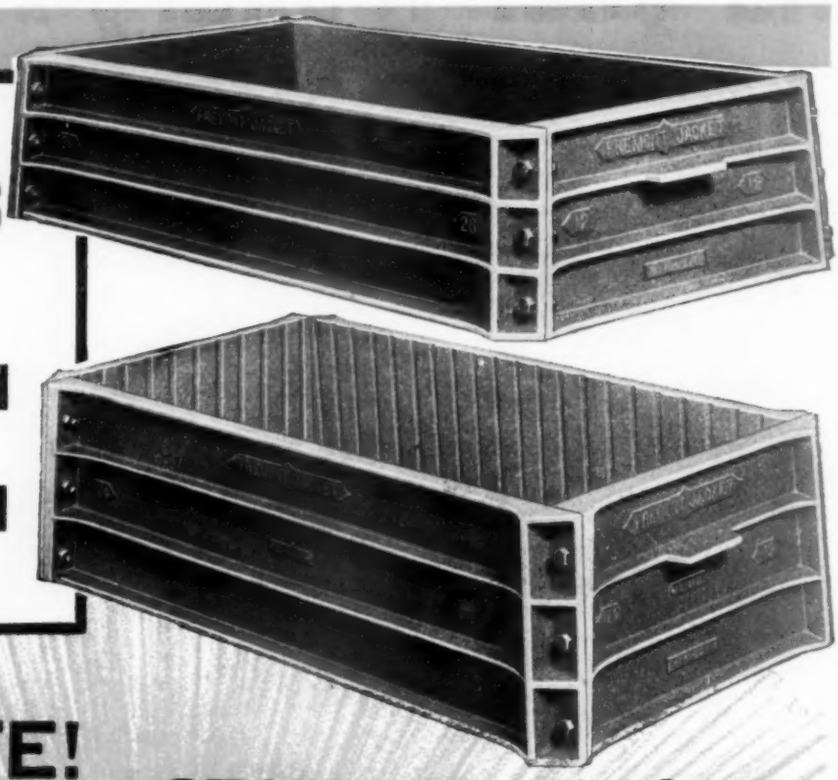
MANUFACTURER'S ASSOCIATION INC. FOUNDRY EQUIPMENT

NATIONAL ENGINEERING COMPANY

MACHINERY HALL BUILDING • CHICAGO 6, ILLINOIS

Manufacturers and Selling Agents for Continental European Countries—The George Fischer Steel & Iron Works, Schaffhausen, Switzerland. For the British Possessions, Excluding Canada and Australia—August's Limited, Halifax, England. For Canada—Dominion Engineering Co., Ltd., Montreal, Canada. For Australia and New Zealand—Gibson, Battle & Co., Pty., Ltd. Sydney, Australia

JACKETS
FURNISHED
IN
CAST IRON
OR
ALUMINUM



ACCURATE! ***STURDY!*** LIGHT!

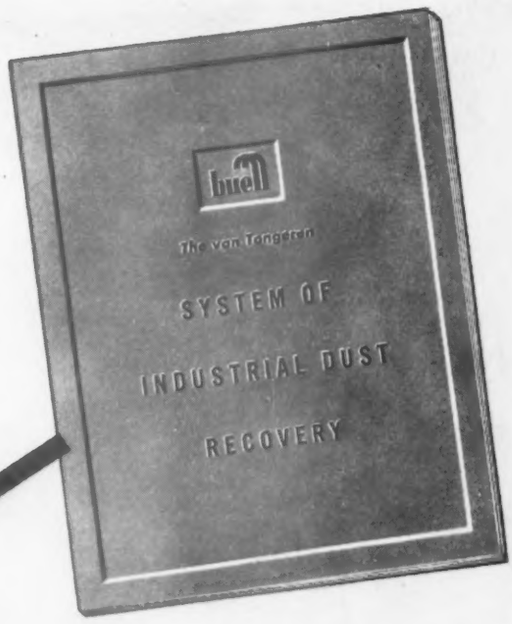
BUILT FOR LONG SERVICE AND FAST PRODUCTION

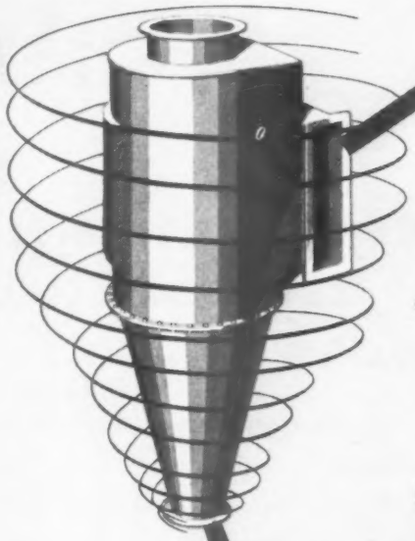
GROOVLOCK
THE FOOL-PROOF PIN

FREMONT MAGNESIUM FLASKS

THE FREMONT FLASK CO.
Fremont, Ohio

Consult Buell *First* in Dust Recovery





Buell Fly Ash Collectors, employing exclusively the well-known van Tongeren System of dust collection, are internationally known throughout industry for "High efficiency, Low maintenance, Long life." Among their outstanding qualities and performance characteristics are: (1) high efficiency mechanical flue dust collection to meet the specific requirements of any job, (2) ready adaptability to any existing duct work, (3) low initial cost, (4) low maintenance and operating cost, (5) power consumption as low as 1 H. P. per 20,000 pounds of gas per hour. Buell's Bulletin, illustrated above, explains in chart and illustration the Buell (van Tongeren) principle of industrial dust recovery.

Every operating executive and engineer will find it most helpful in the selection of dust recovery equipment for his particular requirements.

buell
DUST RECOVERY SYSTEMS

BUELL FEATURES	RESULT IN	PRODUCE
SHAVE-OFF	HIGH COLLECTION EFFICIENCY	GREATER RECOVERY
LARGE DIAMETERS	LESS FAN BLADE WEAR	LOW MAINTENANCE
EXTRA-THICK METAL	LOW DRAFT LOSS	LOW OPERATING COST
LARGE OUTLETS	LOW POWER CONSUMPTION	LONG LIFE
INNER WELDS GROUND SMOOTH	HIGH TEMPERATURE RESISTANCE	NO CLOGGING
CORRECTLY DESIGNED HOPPERS	UNLIMITED CAPACITY	
SPLIT-DUCT MANIFOLDS	NO MOVING PARTS	
	FREE DUST FLOW	

BUELL ENGINEERING COMPANY, INC., 14 Cedar Street, New York 5, N. Y. *Sales Representatives in Principal Cities*

HEAT TREAT DEPARTMENT MAKES 1 SQ. FT. FLOOR SPACE DO WORK OF 4

48" x 48" Super-Cyclone Normalizes 200 Tons Per Month

Cramped for floor space in your heat treating department? Need more flexibility, quicker heats? Production records over 12 months in mid-western foundry show Lindberg Super-Cyclone makes 1 sq. ft. of floor space do work of 4 sq. ft.,—produces four 5000-lb. normalizing heats per 24 hour day, and helps speed shipments of castings.

The 48" dia. x 48" deep Super-Cyclone installation occupies area of 20' x 20', or 400 sq. ft. This includes furnace, insulated cooling pit, quench tank, and basket loading space, as shown in layout above. A conventional car type furnace in same plant requires total space 51' x 30', or 1530 sq. ft.,—almost 4 times that needed for Super-Cyclone.

Plant records show Super-Cyclone normalizes average of 200 tons per month,—the same tonnage as the large car type furnace, so if you are short of space in your heat treating department, check Super-Cyclone production against your present equipment.

Its smaller heats provide flexibility. Production Manager of this foundry says: "The Super-Cyclone saves a lot of space. We ship castings quicker because they come from the furnace quicker. In the Super-Cyclone we turn out a little over four heats a day. Our car bottom turns out 1½ heats a day. The Super helps keep production moving, and customers satisfied."

LINDBERG ENGINEERING COMPANY
2453 WEST HUBBARD STREET, CHICAGO 12, ILLINOIS

LINDBERG FURNACES

SUPER-CYCLONE for hardening, normalizing, annealing, tempering
CYCLONE for accurate, low-cost tempering and nitriding
HYDRYZING for scale-free and decarb-free hardening

Federated — MODERN HEADQUARTERS FOR NON-FERROUS METALS

Howdy—

SEE YOU AT THE
A.F.A. CONVENTION
MAY 6-10
THE AUDITORIUM, CLEVELAND, OHIO
SPACE 437

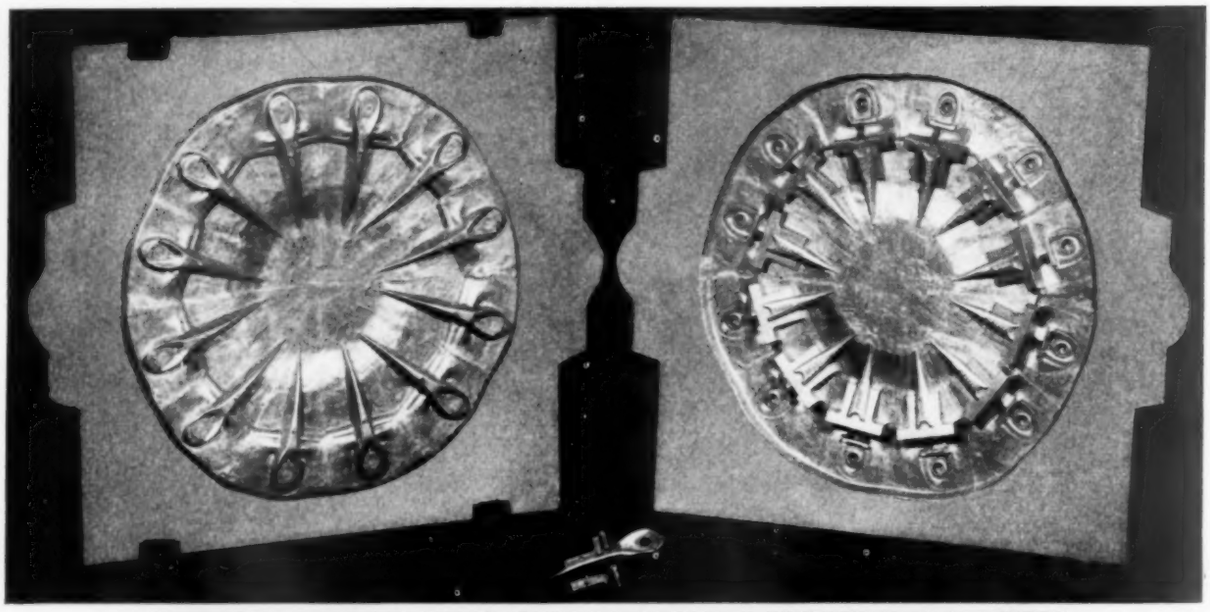
FMD
Federated

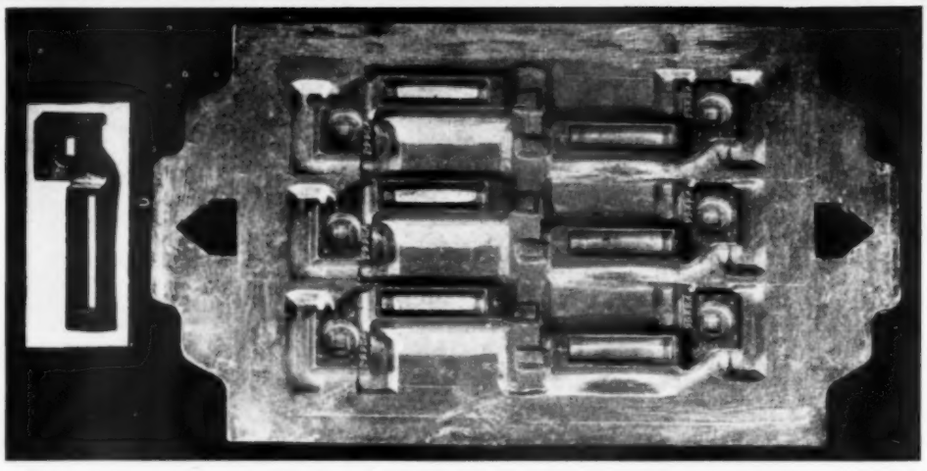
FEDERATED METALS DIVISION
American Smelting and Refining Company
120 Broadway, New York 5, N. Y.
Nation-wide service with offices in principal cities

ALUMINUM • BRASS • BRONZE • BABBITT • DIE CASTING ALLOYS • SOLDER • TYPE METAL • ZINC DUST

FOUNDRYMEN:

At this critical time, with labor and material costs mounting, PRESSURE CAST MATCH PLATES and COPE & DRAG PLATES are the solution to lower production costs.





SINGLE OR MULTIPLE PATTERN MATCH PLATES CAST UNDER PRESSURE IN PLASTER MOLDS

BY

PLASTER PROCESS CASTINGS CO.

6922 CARNEGIE AVE., CLEVELAND, OHIO

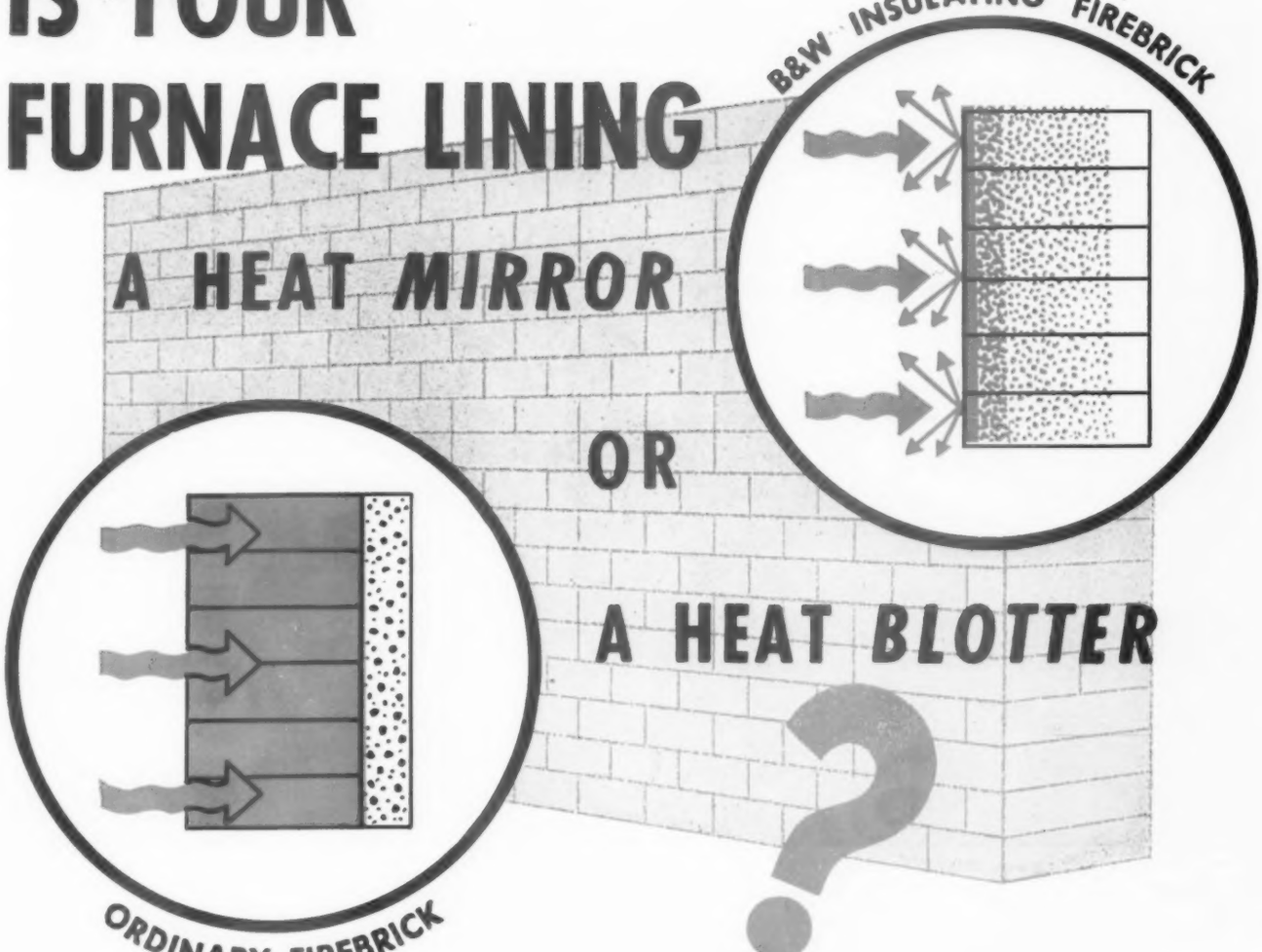
Profit by our many years of experience

IS YOUR FURNACE LINING

A HEAT *MIRROR*

OR

A HEAT *BLOTTER*



When furnaces are constructed of dense firebrick, the walls and roof soak up heat because of their high heat-storage capacity . . . they act as "heat blotters". This results in serious heat losses—losses that are actually measurable in higher fuel costs.

But the low conductivity and low heat storage of B&W I.F.B. act as a "heat mirror"—the heat is thrown back into the charge where it can do useful work.

B&W I.F.B. come to temperature *on the surface* quickly. This means that in batch-type malleable annealing furnaces, heating-up time is cut—often as much as 60 to 70%. A shortened operating cycle and increased production result. Moreover, less fuel per cycle is required because B&W Insulating Firebrick minimize wasteful heat loss. In fact, fuel savings resulting from the use of B&W I.F.B. have often run as high as 33⅓%!

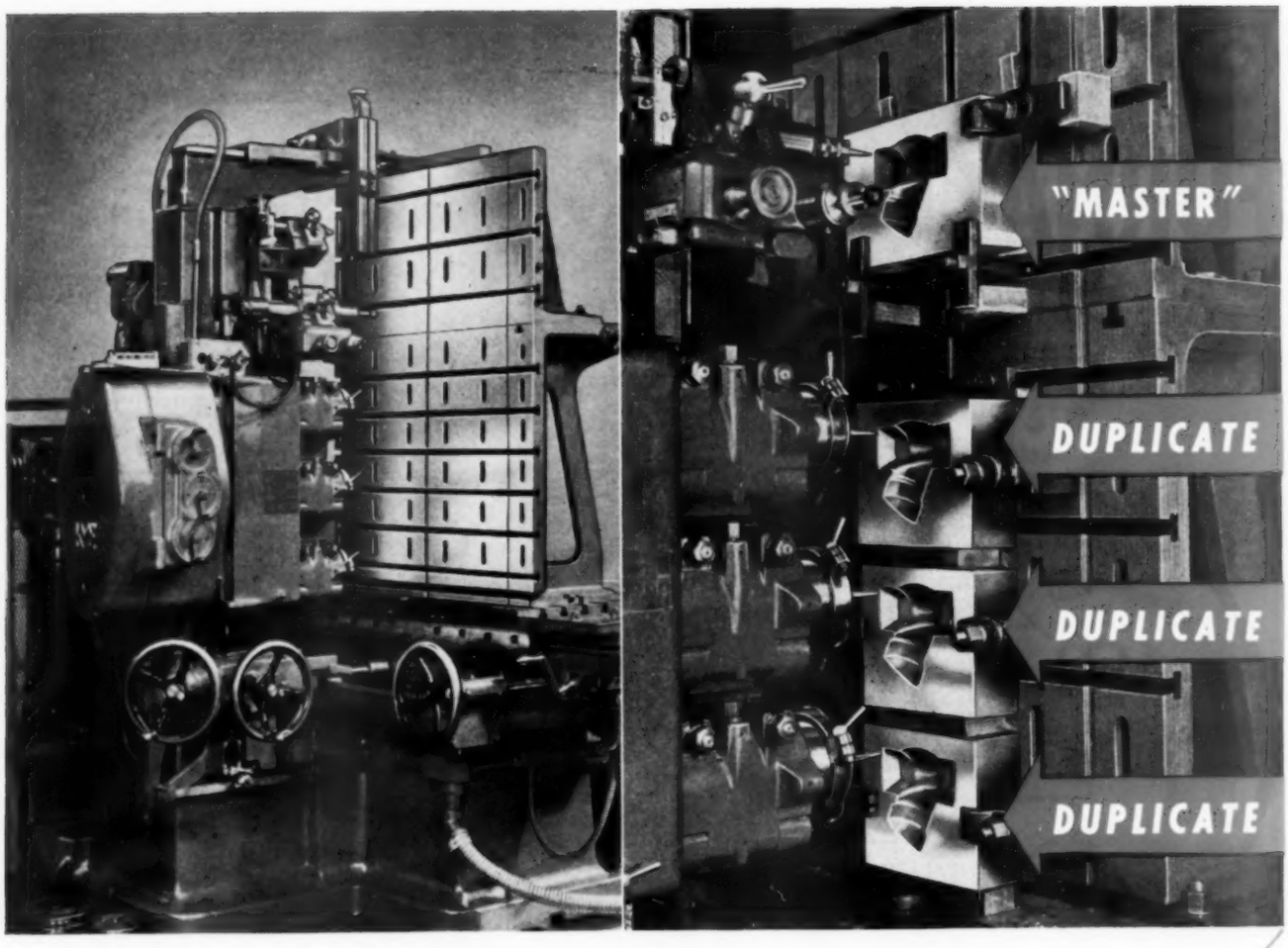
Even in continuous types of furnaces, this "heat mirror" principle results in appreciable fuel savings. Your local B&W Refractories Engineer can help you cut needless heat losses in your foundry heat-treating furnaces. A call or a post card will bring him . . . no obligation, of course.

R-234

Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
85 LIBERTY STREET, NEW YORK 6, N.Y.



Service Now Available

KELLER MACHINE AND PATTERN WORK

HOWARD modern facilities include two 3-spindle, automatic-type Pratt & Whitney Keller Machines which are now available for immediate service on all types of metal duplicating work.

Other **HOWARD** facilities include wood and metal production patterns, brass, bronze and gray-iron castings.

At **HOWARD**, you will find the highest type of skilled craftsmen and modern equipment — a combination that assures you of patterns and castings that are precision-engineered to fit your individual foundry requirements. Your inquiry is invited.

No Pattern too Large or Small for our Consideration

HOWARD FOUNDRY CO.
Pattern Division
1700 N. KOSTNER AVE. CHICAGO 39, ILL.

ARMY E NAVY

HOWARD

ALUMINUM BRASS BRONZE MAGNESIUM SEMI-STEEL

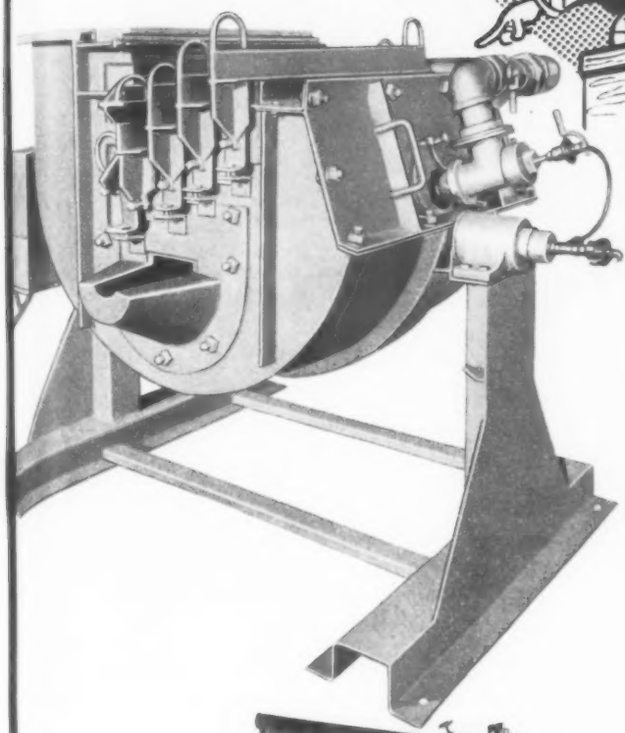
PATTERNS

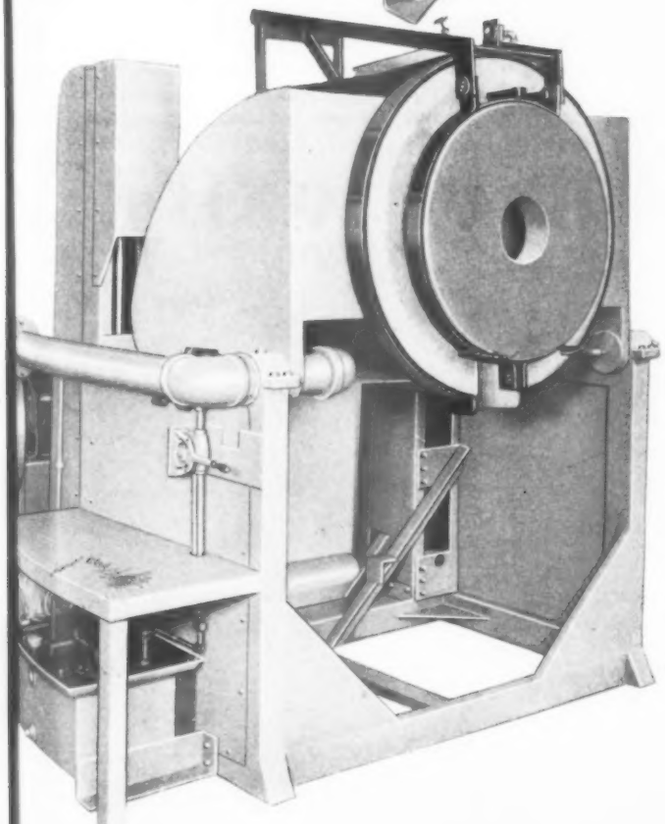
COME ONE! COME ALL!

Visit the Exhibition of STROMAN FURNACES AT BOOTH 1012

During the 50th Anniversary Foundry Congress and Show

May 6th to 10th
Cleveland
Ohio





See the Sensational New SKLENAR FURNACE

. . . That is setting records for melting GREY IRON as well as copper alloys in capacities up to 10,000 pounds.

See the New STROMAN CRUCIBLE HYDRAULIC TILT MELTING FURNACE

for Brass or Aluminum that handles up to 400 crucible.

Many other advanced Stroman Furnaces will also be on display, in fact a size for most every purpose . . . and Stroman Engineers, who are qualified experts in melting room problems and foundry layout will be on hand to consult with you.

Make a visit to the Stroman Display in Booth 1012 a must when you attend the convention.

STROMAN FURNACE & ENGINEERING CO.

DIVISION OF

THE PETERSEN OVEN CO. 300 W. ADAMS ST. CHICAGO 6

See these famous TAMMS PRODUCTS

Booth 132

GOLDEN JUBILEE

TAMASTONE PATTERN COMPOUND

See It Demonstrated at the Show!

See how easy it is to convert loose and metal gated patterns into one or more TAMASTONE match plates . . . save hours on every job! See for yourself how bench or floor molding can be made into cope and drag jolt roll-over jobs . . . learn how, with COMBINATION TAMASTONE PLATES, you can now turn out "nuisance" jobs, heretofore considered impractical, in record time! Learn why leading foundries are able to speed up production as much as 400% and cut costs 75%.

TAMMS LIQUID PARTING . . . No messy dust to contend with! Just spray it on and dry with air hose. No sand to stick to pattern and spoil detail . . . you get accuracy every time! No "build-up" on pattern . . . you get long runs without recoating! See it demonstrated at the booth any day of the show!

PLASTIC METAL FILLER . . . for filling and smoothing rough metal surfaces, castings or metal match plates.

TAMMS MODELING CLAY . . . a plastic clay to be used for changing gates and risers.

TAMMS METALINE . . . liquid metal coating seals wax fillets and gates before applying liquid parting. Prevents hot sand from sticking to same.

TAMMS PYRAMID SKIMMERS . . . for brass and bronze—eliminates metal contamination.

TAMMS PYRAMID PYROMETERS . . used for accurate temperature readings in non-ferrous foundries the nation over!

TAMMS No. 90 IRON OXIDE

Here's a CORE SAND MIX that will *prevent* core sand failures —*improve* castings—*reduce* cleaning costs! Big claims, that's true, but you don't have to take our word for it . . . *READ* the letter reproduced at the right and learn first hand about Commercial Steel Casting Company's experience! It's a proven fact that Tamms No. 90 Iron Oxide definitely prevents core burning, veining and penetration. Grey iron and steel foundries everywhere recommend its use! Inexpensive too . . . only a mixture of 2% by volume of sand is required to increase temperature strength of core sand! Write for SAMPLE now!

TAMMS No. 100 LIQUID CLEANER for CORE EQUIPMENT

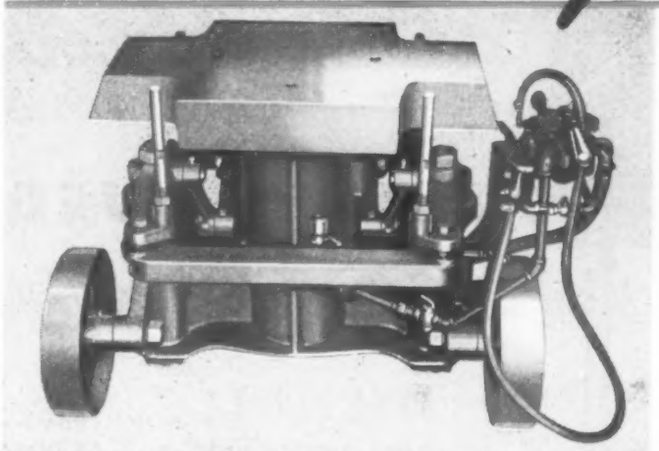
. . . soaks 'em clean in half the time! Cleans metal core boxes, drier plates, blow plates, core vents, etc. without a bit of scouring or scraping. It's fast-acting, thorough, won't harm metal! SAMPLE SENT FREE!

TAMMS SILICA COMPANY, 228 N. La Salle St., Chicago 1, Illinois

Representative to France, Belgium, Luxemburg

Ph. Bonvillain & E. Ronceray, Rue Paul Carle, Choisy le Roi (Seine) France

ARCADE *Foundry Equipment*



JOLT STRIPPER *Air Lift*

No. 5205

SPECIFICATIONS

Jolt cylinder diameter	5 in.
Jolt capacity at 80 lbs.	500 lbs.
Table size	16 x 25 in.
Strip	6 in.
Draw cylinder diameter (two)	2½ in.
Pin centers (width maximum)	17 in.
Pin centers (width minimum)	10 in.
Pin centers (length maximum)	23½ in.
Pin centers (length minimum)	17½ in.
Diameter of wheels	12 in.
Weight crated	1150 lbs.

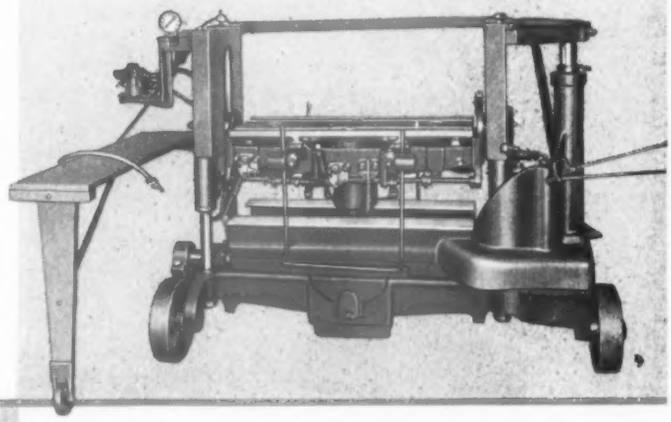
Made in other sizes.

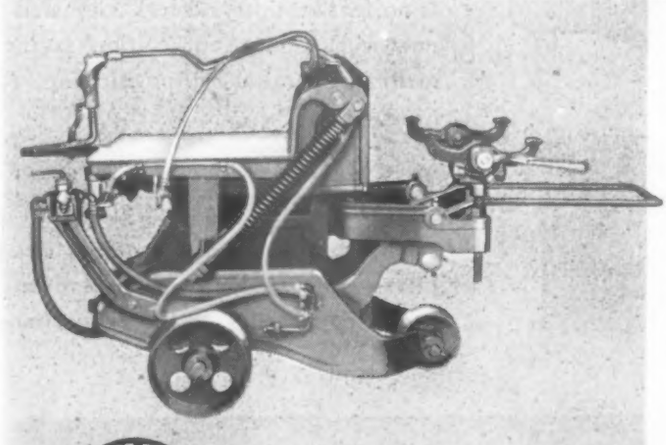
JOLT MODERNS *Heavy Duty Type*

SPECIFICATIONS

	WITH JOLT			
	HD	HD	HD	HD
Machine Number	112	221	330	440
A—Length of Pattern Table	34"	38"	42"	46"
B—Pattern Draw	8"	10"	10"	10"
C—Extreme Head of Table	20"	23"	23"	23"
D—Diameter Guide Shaft	1 15/16"	1 15/16"	1 15/16"	1 15/16"
E—Guide Shaft Centers	14"	14"	14"	14"
F—Swing Table Shaft	2 7/16"	2 15/16"	2 15/16"	2 15/16"
G—Diameter Adjusting Screw	1¼"	1¼"	1¼"	1¼"
H—Diameter Jolt Cylinder	5"	6"	6"	6"
I—Dia. Squeeze and Draw Cyl.	7"	8"	9"	9"

Note:—HD Heavy Duty.





18 in. ROLLOVER WITH JOLT

Hand Roll-Foot Draw

SPECIFICATIONS

Jolt cylinder diameter	4 in.
Jolt capacity at 80 pounds	300 lbs.
Table size	18 x 18 in.
Maximum width of flask	18 in. — outside
Draw (foot)	6 in.
Weight crated	975 lbs.
Allowance for depth of flask, pattern plate, and bottom board	11½ in.

ROCKWELL · r · ARCADE

ARCADE MANUFACTURING DIVISION

ROCKWELL MANUFACTURING COMPANY

FREEPORT, ILLINOIS

NICHOLLS Heavy Duty

35 Years

No. 18-44 Type "K" Heavy Duty Jolt and Power Squeezer with Pneumatic Pattern Draw and Open End Frame. Equipped with Parallel Squeeze Head.

JOLT, SQUEEZE A
Operated by P

NICHOLLS Molding Machines are the product of 35 Years of improvement, research and tests. They are machines that embody all the highest requirements necessary in modern, high-speed foundry work and have proven their ability to "take it" day in and day out, regardless of production pressure.

BIG OUTPUT

Speed of operation for Type "K" Molding Machines is obtained by keeping the number of working parts and their controls down to a minimum. Consequently there is no lost motion and less confusion for a new workman. Another time saving feature is the parallel, self-positioning squeeze head.

PRECISION BUILT

NICHOLLS Molding Machines are completely built in our own modern machine shops, equipped with the proper machine

WM. H. NICHOLLS C

Foreign Manufacturers and Selling Agents for Continental Europe and Gre Britai

MOLDING MACHINES

of Precision Building

AND PATTERN DRAW....
PNEUMATIC POWER

tools and accurate jigs and fixtures. While the specifications call for close tolerances, still the moving parts are smooth and sensitive in operation with the freedom needed in speeding production.

LOW UPKEEP

To assure satisfactory performance over extended periods, dirt-proof housings and forced lubrication have been provided for all parts that might otherwise wear quickly. Large numbers of NICHOLLS Molding Machines have been delivered to foundries in the United States and other countries. Our service records indicate they are standing up with comparatively few requests for replacement parts.

CONTROLS

These machines can be equipped with Push-Button Control for all operations, including Jolt and Squeeze Timing.

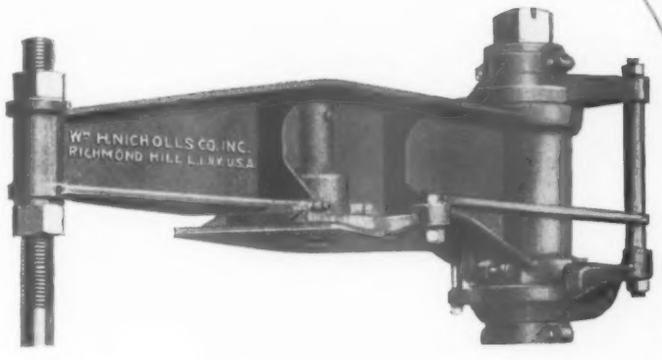


Illustration showing the rear view of the heavy cross-arm with outboard bearing and self-positioning parallel squeeze head

CO., Inc. RICHMOND HILL (18), LONG ISLAND, N. Y.

Britain—The George Fischer Steel and Iron Works, Schaffhausen, Switzerland

The "Falls Brand" Family

are again happy to be able to extend to our many friends a sincere invitation to visit with us at the 50th anniversary convention of the American Foundrymen's Association at Cleveland.

Many members of our staff will be in the booth to discuss with you the latest things in alloys and metallurgical procedure. If you have a problem discuss it with us. We can probably help you solve it as we have thousands of others.

We Will be Looking for You

NIAGARA FALLS SMELTING & REFINING CORPORATION

America's Largest Producers of Alloys

BUFFALO 17, NEW YORK

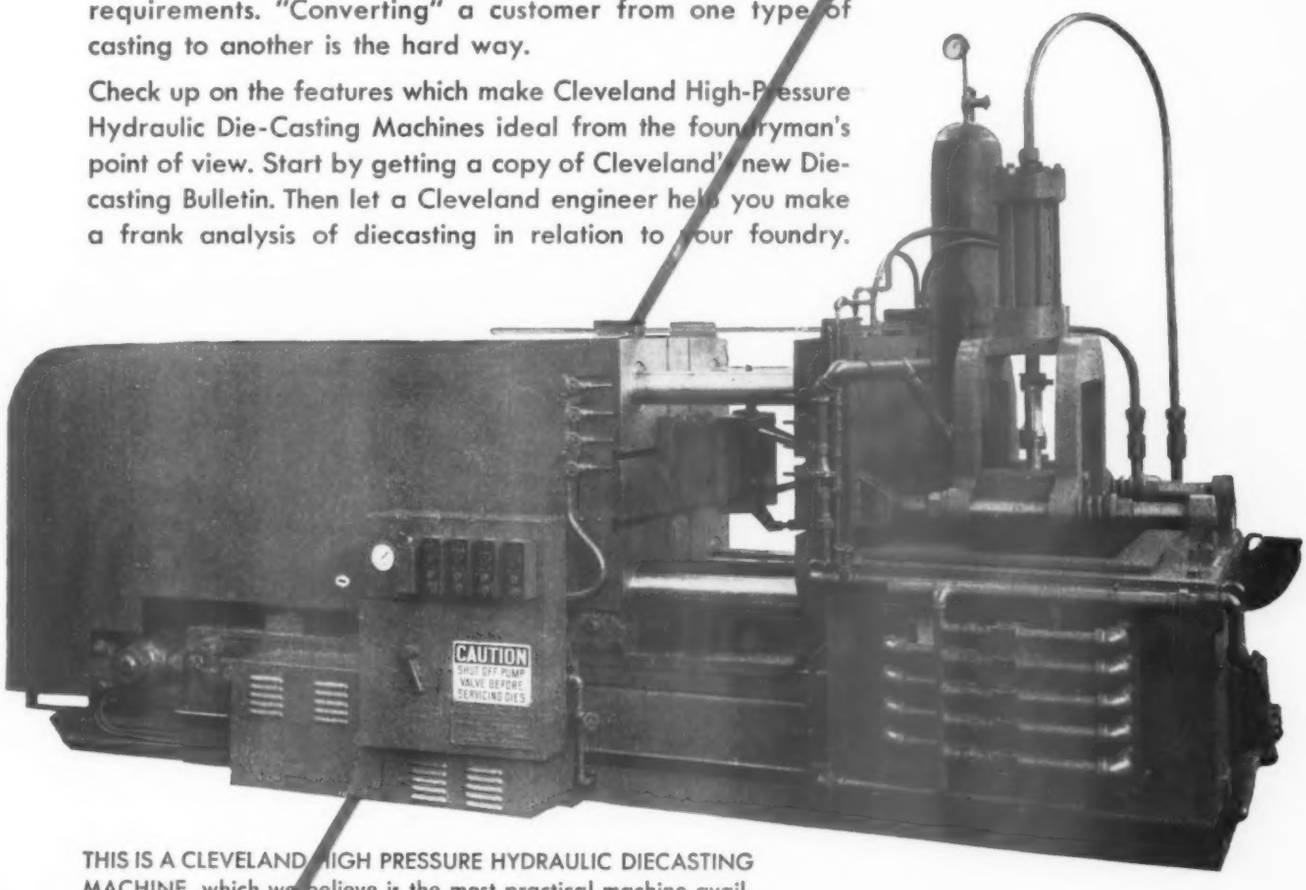
Have You Looked Squarely at Die Casting?

There is no profit in holding a hand over your eyes and saying "It ain't so" when approached on the subject of modern diecasting departments for non-ferrous foundries. Foundrymen, and diecasting itself, have outgrown the old ideas that this automatic production was a competition to be shunned, or (even more shortsighted)..."never would amount to anything."

Progressive foundrymen know that most profit comes to those who can supply just the *right kind* of castings in *whatever quantity* and at *low costs* strictly dictated by customers' requirements. "Converting" a customer from one type of casting to another is the hard way.

Check up on the features which make Cleveland High-Pressure Hydraulic Die-Casting Machines ideal from the foundryman's point of view. Start by getting a copy of Cleveland's new Diecasting Bulletin. Then let a Cleveland engineer help you make a frank analysis of diecasting in relation to your foundry.

AN INVITATION *is cordially extended to all visitors at the Golden Jubilee Foundry Congress to visit the factory of The Cleveland Automatic Machine Company. See a Cleveland Diecasting Machine. Phone Glenn Miller at ENdicott 1321.*



THIS IS A CLEVELAND HIGH PRESSURE HYDRAULIC DIECASTING MACHINE, which we believe is the most practical machine available, because of its unusual simplicity, heavy duty construction and capacity for high production of uniform quality castings. Ask for the Cleveland Diecasting Bulletin describing it.

THE CLEVELAND AUTOMATIC MACHINE COMPANY

2265 ASHLAND ROAD • • CLEVELAND 3, OHIO

CHICAGO (6) 1408 Civic Opera Bldg. CINCINNATI (12) 4932 Beech St. DETROIT (2) 540 New Center Bldg.
HARTFORD (1) 529 Capitol National Bank Bldg. NEW YORK (6) 2402 Singer Bldg.

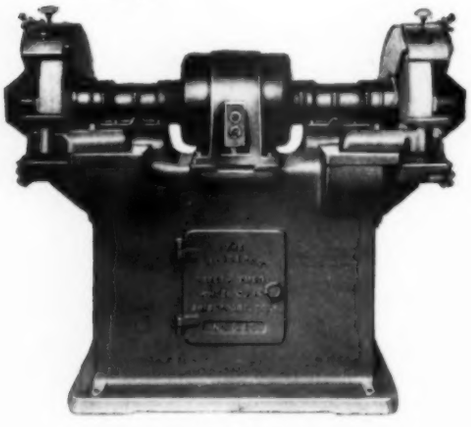
POWER!

BUILT TO GET THE WORK OUT!

"Bridgeport" High Speed Grinder

A heavy duty grinder designed for maximum stock removal with high speed Resinoid Wheels up to 30" dia. x 4" face. Three speeds, with interlocking guard to insure proper speed of grinding wheel. Heavy welded sheet steel guards stand tremendous strain and afford ample capacity for exhaust and protection for the operator.

Two high carbon steel, spindles of large diameter (one for each wheel) joined by a flexible coupling. Each spindle carried on two large, precision matched Timken bearings in independent housings.



No. 6AC HEAVY DUTY GRINDER

A Speed Control, which automatically warns the operator when the wheels reach a point where the speed should be increased, insures efficient operation, also prevents over-speeding. Large-hole wheels are used, and may be worn down to the flanges with safety.

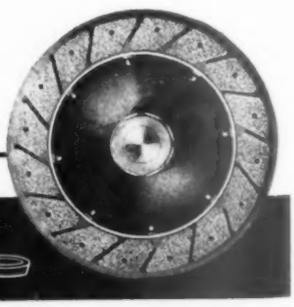
These grinders are powered with either a 10 HP or 15 HP motor. The No. 6AC Heavy Duty Grinder illustrated at the left is a smaller type with a 5 HP motor. The "Bridgeport" line of Floor Grinders ranges from 1 HP to 15 HP.

Full detailed information sent on request. If you will describe your need, our engineers will gladly make recommendations.

THE BRIDGEPORT SAFETY EMERY WHEEL CO., INC., Bridgeport, Conn.

Bridgeport

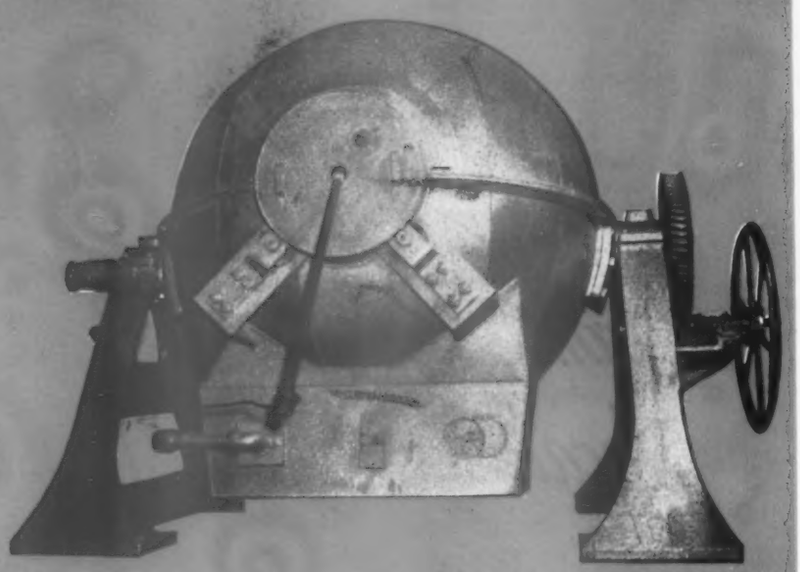
GRINDERS • GRINDING WHEELS • BUFFING LATHES



NOW--MELT 3000 LBS. AT ONCE WITH A

ROMPH ROTATING FURNACE

A Revolutionary NEW-TYPE MELTING FURNACE FOR *Aluminum*



Note these IMPORTANT improvements in Aluminum Melting Practice

This new development is the design of Mr. Paul Romph, a practical foundryman, and is now offered as a direct aid in meeting post-war competition.

EXTREMELY FINE-GRAINED METAL

Since the metal charge *at no time* comes in contact with a direct flame, a melt of extremely fine grain and superior quality is produced. Hydrogen absorption is practically eliminated. There are no "local" hot spots and iron pick-up is consequently less. Fluxing by gas or solid material is possible.

LOWER FUEL COSTS—FASTER MELTING

Note this typical aluminum heat: heel—300 lbs; ingot charge—2750 lbs; burner time—*136 minutes* (to 1400° F). Fuel consumption (gas)—2,924 cu. ft. or slightly over one *cu. ft. of gas per pound of metal.*

EASIER TO OPERATE AND MAINTAIN

In case of pot failure, the charge is not lost. Merely rotate pot to another position and continue melting. In one large production foundry, a run of 3 weeks additional was possible after the pot had been repaired.

FURTHER SPECIFICATIONS AVAILABLE IN FOLDER "F-1"

Melting pot may be changed in few minutes. No long cool.ng period required before changing.

Easy to charge. Even under maximum operation, the outer shell does not become hot.

Charges may vary from 1000 to 3000 lbs. Large castings can be poured from one furnace melt.

ROMPH FURNACE COMPANY

7849 HARTWELL **DEARBORN, MICH.**

All ELECTROMET Ferro-Alloys a

TRADE-MARK

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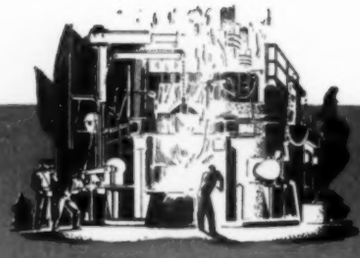
from conveniently located points



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ELECTROMET SERVICES HELP YOU MAKE IRON AND STEEL . . . AND SELL YOUR

s are Available

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Low-Carbon Ferrochrome (in grades, maximum 0.03% to maximum 2.00% carbon)
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Chromium Metal
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CMSZ Alloy
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CALCIUM

Calcium-Silicon
Calcium-Manganese-Silicon
Calcium Metal

COLUMBIUM

Ferrocolumbium

MANGANESE

Standard Ferromanganese
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Low-Iron Ferromanganese
Manganese Metal
Miscellaneous Manganese Alloys

SILICOMANGANESE

TUNGSTEN

Ferrotungsten
Tungsten Powder

BORON

Ferroboron
Manganese-Boron
Nickel-Boron
SILVAZ Alloy
SILCAZ Alloy

SILICON

Ferrosilicon 15%
Ferrosilicon 50%
Ferrosilicon 75%
Ferrosilicon 80 to 90%
Ferrosilicon 90 to 95%
Silicon Metal
SMZ Alloy
Miscellaneous Silicon Alloys

TITANIUM

Ferrotitanium
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Zirconium 12 to 15%
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ELECTROMET Ferro-Alloys and Metals are sold by Electro Metallurgical Sales Corporation; and Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

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Ferro-Alloys & Metals

6 TONS OF SHEET ALLOY ANNEALING BOXES *DOUBLE THE OUTPUT OF* 16 TONS OF CAST BOXES

(Cast Boxes)

This is a case history at a well known malleable foundry that is typical of how P. S. (for Pressed Steel) Plant Analysts' recommendations produce results with P. S. Sheet Alloy Equipment.

The car at the left shows the cast boxes that were replaced by the new boxes below which weighed two-thirds less. And the 22 new P. S. boxes increased furnace capacity by taking up no more room than the 18 old boxes.

P. S. fabricating facilities are flexible and adapted for the production of lightweight, welded alloy heat treating equipment that has a reputation among foundries for long life and increased output.

We would like an opportunity to make recommendations for increasing your foundry output.

(PS Welded, Sheet-Alloy Boxes)

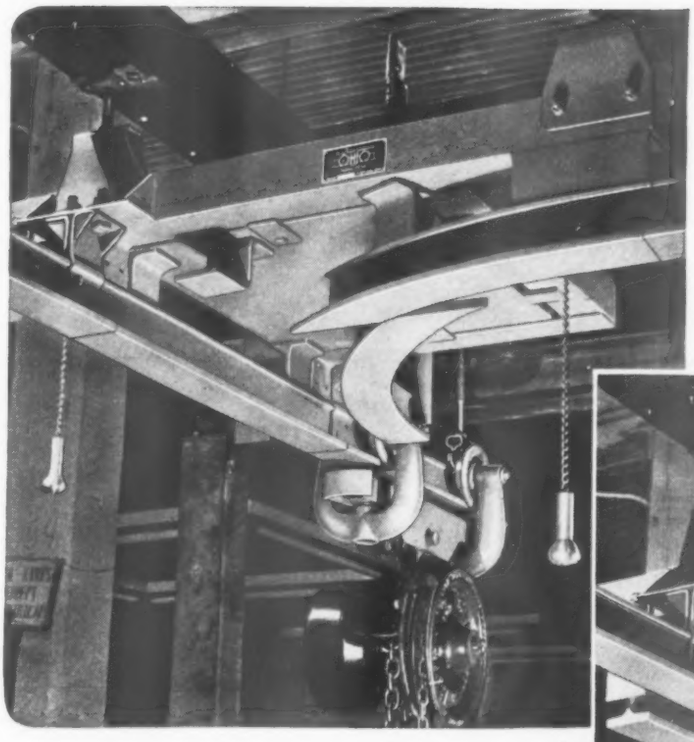
THE PRESSED STEEL COMPANY

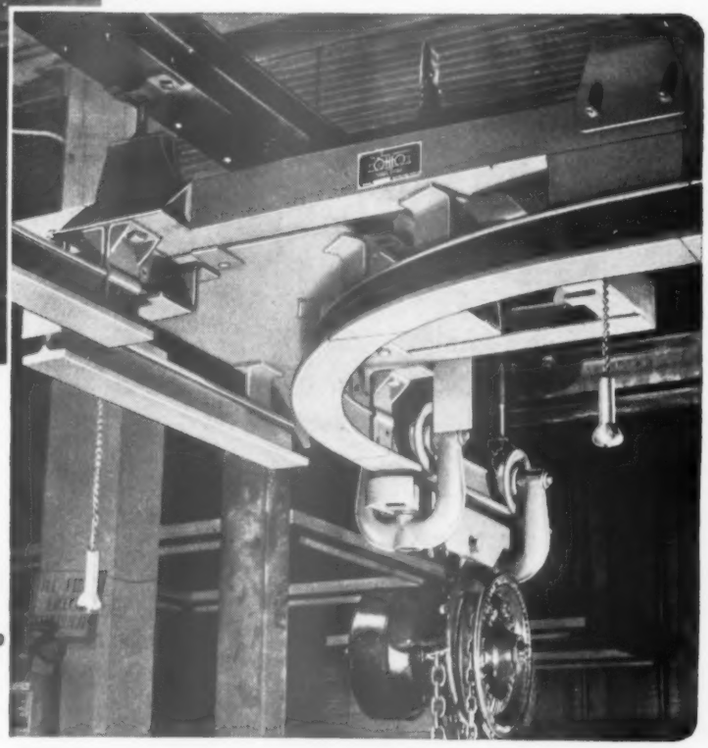
of WILKES-BARRE, PENNSYLVANIA

BRANCH OFFICES: 312 Curtis Bldg., Detroit; 503 Nicholas Bldg., Toledo; 1915 Engineers Bldg., Chicago; 51 E. 42nd St., New York; 1005 Sterling Bldg., Houston, Texas; A & M Accessories Ltd., 19 Melinda St., Toronto, Canada; Broad St. Station Bldg., Philadelphia; 417 So. Hill St., Los Angeles.

PRESSED STEEL COMPANY PRODUCTS: Carburizing and Annealing Boxes, Thermocouple Protection Tubes, Seamless Steel Cylinder Caps, Seamless Steel Neck Rings, Welded Alloy Tubing for High Temperature and Corrosive Applications, Radient Tubes, Inner Covers and Base Sheaths for Steel Mills

NEW improved *Safety* FEATURES





Built into

The engineering design of OHIO Tramrail Systems assures greater safety at all times, regardless of carriage position. Note opening position of switch in left photo and closed position at right. The switch is

Fully Safeguarded with Baffles
No chance for trolley to roll off. This is another OHIO feature for greater safety and service reliability.

More Compact Design
is another OHIO feature requiring a minimum of superstructure and fittings. Spur tracks are as close as 30 inches in spacing and only straight track is run into the switches.

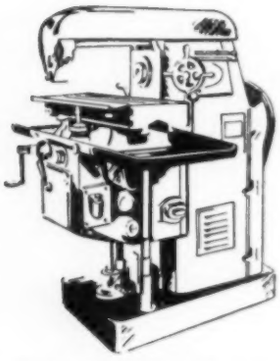
90° Curve Built Integral with Switch
The 90° curve is made in right hand, left hand, "Y" and 3 way. All easily electrified for motor operated equipment. All angular rails are accurately cut with correct spacing at the factory.

No More Fitting on the Job
By avoiding the old cumbersome methods of fitting the curved tracks on the job, time and money is saved and your installation is a standard factory production job. These are only a few of the finer OHIO features. For further details write for literature.

THE *Worker* CORPORATION
1826 EAST 47th STREET · CLEVELAND 3, OHIO

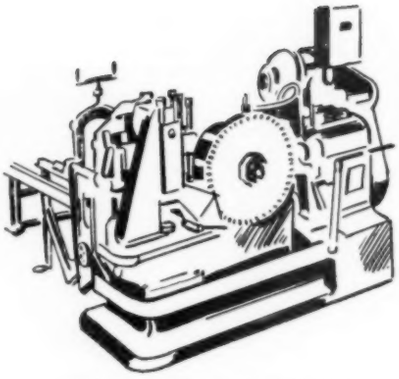
GOVERNMENT OWNED SURPLUS

MACHINE TOOLS



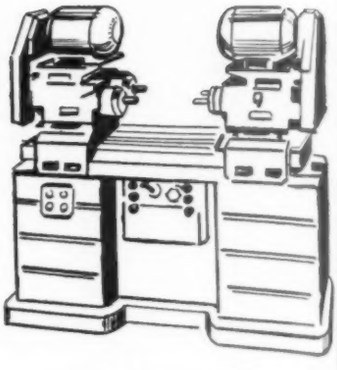
AUTOMATIC BED TYPE MILLING MACHINES

Models 1-12 and 1-18, located in New York, Detroit, Cleveland, Chicago, and Boston Regional Offices.



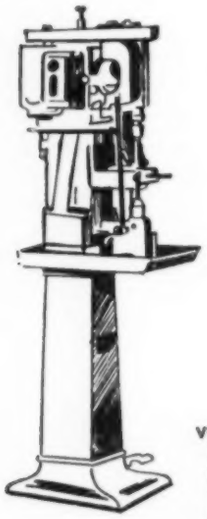
COLD SAWING MACHINES, CIRCULAR

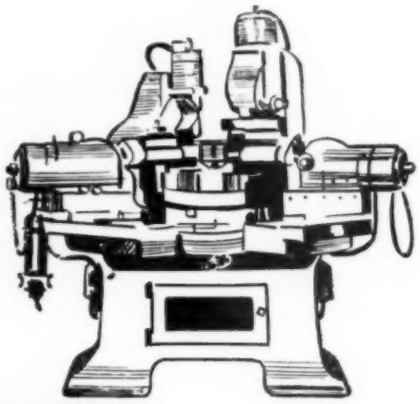
1¼" to 21" capacity, in standard models of well known makes, located in Detroit, Chicago, Cleveland, Philadelphia, Boston Regional Offices.



PRECISION BORING MACHINES

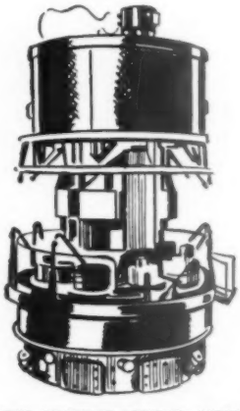
Both single and double end types located in Detroit, Chicago, Boston, Cleveland, Minneapolis, Kansas City and, in lesser quantities, other Regional Offices.





VERTICAL & HORIZONTAL DRILLING MACHINES

Special Kingsbury type machines located in Boston, Chicago, Detroit, Philadelphia, Richmond, St. Louis and, in limited quantities, other Regional Offices.



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Largest inventories located in Boston, Chicago, Cleveland, Detroit, New York and Philadelphia.

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MODERN MACHINES . . . MANY MODELS . . . STANDARD MAKES

These machine tools *must* go to work. You need the profits. America needs the production. Taxpayers need maximum recovery to the government of their original cost. On hand, at every War Assets Administration office in the U. S. there are hundreds of these machines. Nearly every category of modern production equipment can be obtained at low cost. You have a unique opportunity to initiate new enterprises or modernize old . . . and at the same time do your country an important service. Check this partial list over carefully for equipment you can use. Then write, wire, or phone your nearest War Assets Administration office for detailed information, or if you prefer mail the coupon.

CHECK LIST OF SPECIAL MACHINE TOOL BUYS!

Here are a few of the many thousands of machine tools available through War Assets Administration.

MACHINE (Function)	TYPE	SIZE OR CAPACITY	Quantity Available Now
Boring, Drilling & Milling	Horizontal	Under 3" to 6"	209
Boring & Turning Drills	Vertical	Under 36" to 120" Swing	683
Boring Fixed Rail Tank Mill	Vertical		87
Precision Boring Machines	Horizontal bridge—single end	Under 8" to 14"	486
	Horizontal bridge—double end	Under 8" to 14"	226
Drills	Box column—single spindle	Under ½" Cap. Up to 22" Swing	287
		½" to 1" Cap. 16" to 24" Swing	187
	Round column—single spindle	Under ½" Cap. Up to 22" Swing	738
		½" to 1" Cap. 16" to 24" Swing	1163
	Sensitive Floor & Pedestal Box column	Under ½" Cap. 12" to 22" Swing	933
		½" to 1" Cap. 16" to Over 24" Swing	1875
		1" Cap. and over 24" Swing and over	434
	Sensitive Floor & Pedestal Round column	Under ½" Cap. 12" to 22" Swing	384
		½" to 1" Cap. Under 16" to 24" Swing	1131
Drills	Sensitive Floor & Pedestal Upright Type—Box column	Up to 28" Swing	549
	Sensitive Floor & Pedestal Upright Type—Round column	Up to 28" Swing	161
	Heavy Manufacturing Type	Up to 32" Swing	296
	Spec. Kingsbury Way & Vertical		250
Gear Hobber	Horizontal	4" to 16" Cap.	321
	Vertical—Universal	Under 16" Diameter	89
Gear Shapers	External & Internal	Up to 40" Diam.	280
	Spur—External only		152
	Spur & Helical—External & Internal	Up to 25" Diam.	275
	Spur & Helical—External only		159
Gear Cutters	Bevel Type not incl. Plainer Type Str. Bevel	Up to 36" Diam.	377
Gear Tooth Finisher	Generating Type Grinding		140
	Formed Wheel Type		190
Gear Tooth Lapper	External only		80
	Comb. External & Internal		57
Gear Tooth Shaver	Rotary Type		133
Grinder	External Cylinder—Plain	Up to 20" Swing	1730
	External Cylinder—Universal	Up to 16" Swing	347
	Centerless—Internal and External	All sizes	607
	Cam		223
	Crank Pin		83
	Valve		245
	Internal Cylinder—Mechanical Feed	All sizes	320
	Internal Cylinder—Hydraulic Feed	Up to 42" Swing	1094
	Internal Cylinder—	Under 12" Swing	151
	Internal Cylinder—Auto. Siz. Comb. Hole & Face	16" Swing and over	127
	Internal Cylinder—Auto. Siz. Planetary Type	Under 16" Diam.	39
	Internal Cylinder—Auto. Siz. Centerless	Up to 28" Diam.	146
	Surface—Horiz. Spindle Rotary Table	All size table diam.	274
	Surface—Vertical Single Spdl. Rotary Table	12" to 48" Table Diam.	157
	Surface—Reciprocating Horiz. Spindle—Hand Feed	12" length work cap. and over	146
	Surface—Reciprocating Horiz. Spindle—Power Feed	Under 18" to 120" length work cap.	840
	Thread—External only	All sizes	635
	Thread—External & Internal	8" Cap. and over	82
	Tool & Cutters—Universal	All sizes	691
	Drill	All sizes	348
	Single Point Tool	All sizes	458
	Bench—Double End	All sizes	2876
	Bench—Single End	Up to 8" Wheel diam.	1105
	Floor—Double End—Dry	Up to 24" Wheel diam.	831
	Floor Comb.—Wet & Dry	10" to 16" Wheel diam.	216
	Bench Floor & Snag—Swing Frame		155
	Comb. Grinder & Buffer		1805

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Use this coupon to conserve your time. Print in a brief description of the make, type, model, and size of machine in which you are interested. We will determine *in advance* our stock situation on the machines and inform you quickly. No obligation, of course.

To War Assets Administration: Do you have in surplus stocks the following machine tools? Where are they located? What is their condition?

Type.....Make.....Model.....Size.....

....

....

Name.....Tel. No.....

Title.....

Firm.....

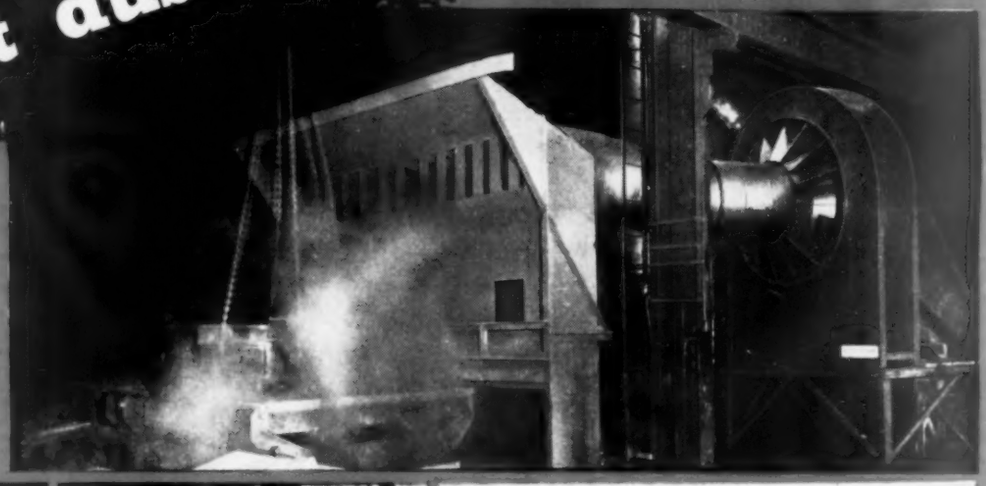
Address.....

City.....State.....

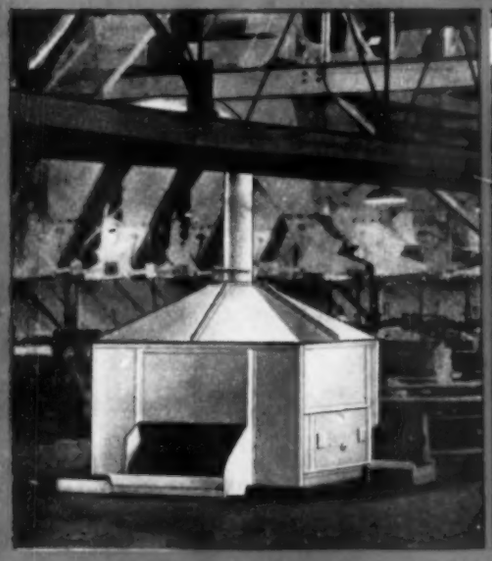
277-3

Look at these solutions to the shakeout dust problem

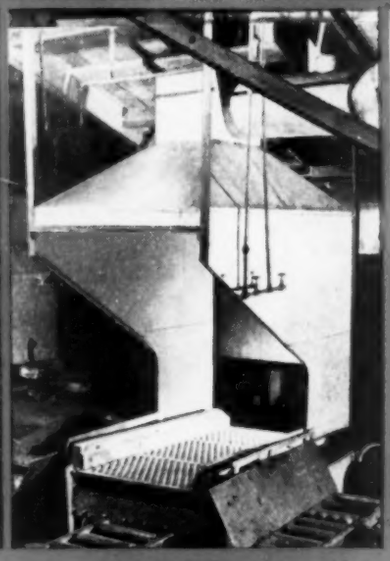
MANUFACTURER'S ASSOCIATION, INC. FOUNDRY EQUIPMENT



The AAF side hood exhausted by the Type W Roto-Clone—arrangement "A"—is applicable to the largest of foundry shakeouts.

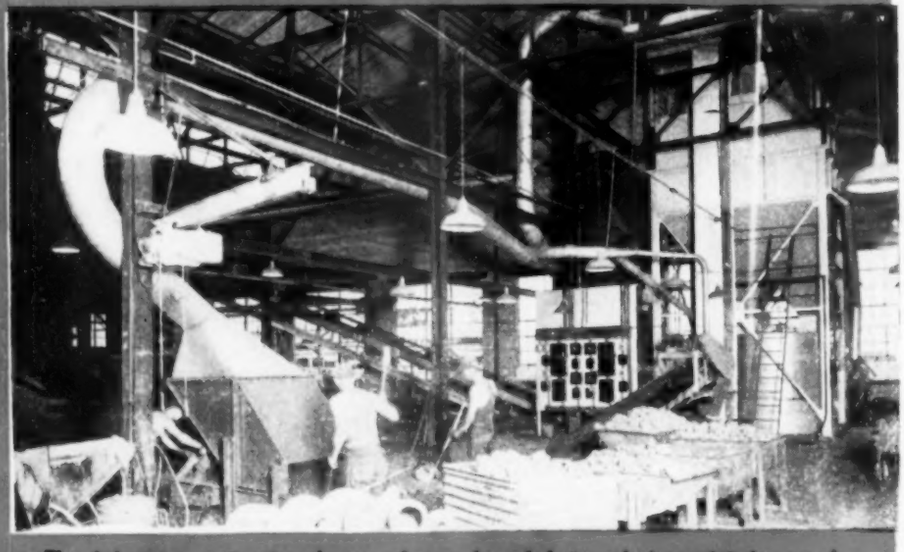


The complete enclosure exhausted by a Type W Roto-Clone provides ideal dust control.



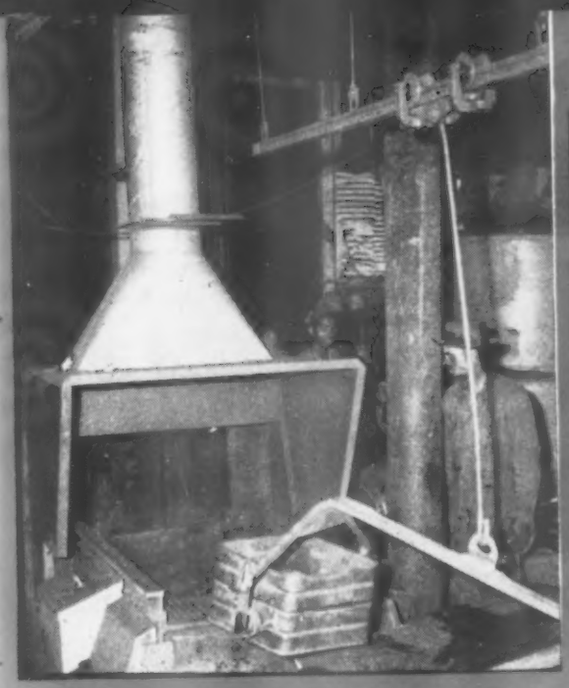
Openings to overhead hood must be engineered to the shakeout proper.

Large shakeouts require side shields to prevent distortion of exhaust air flow.



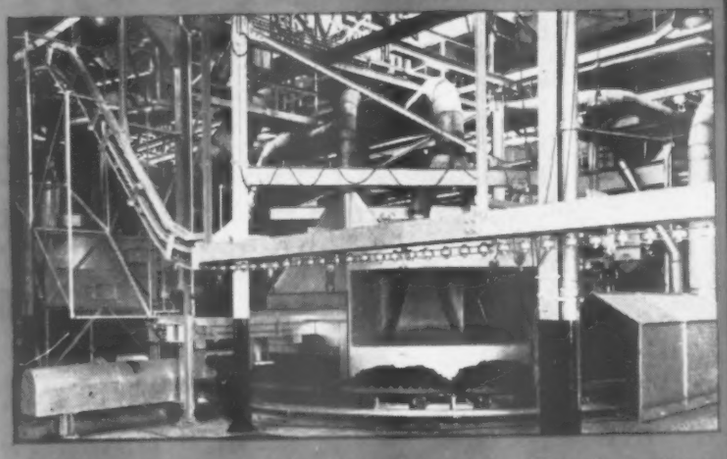
The shakeout operation is only one of a number of dust producing points in a sand preparation set-up. Similar installations to this, using the Type W Roto-Clone may be found in hundreds of U. S. foundries.

The combination of engineered shakeout hood design plus the Type W Roto-Clone has been the solution to hundreds of shakeout dust problems throughout the industry . . . While each shakeout problem is fundamentally an individual one—our wide experience has enabled us in most cases to adapt to your problem one of the score of hood and Roto-Clone combinations already engineered. This service is yours without obligation.

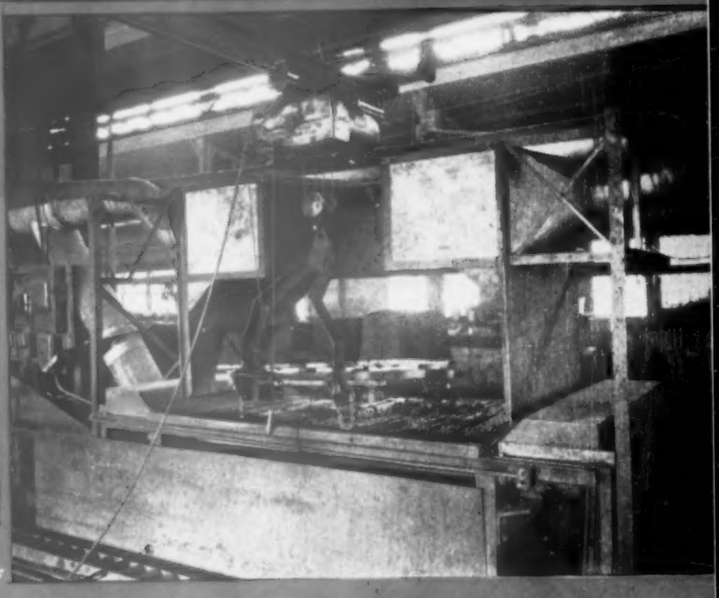


Enclosures of this type for foundry shakeout, provide exhaust hood in direction of dust travel.

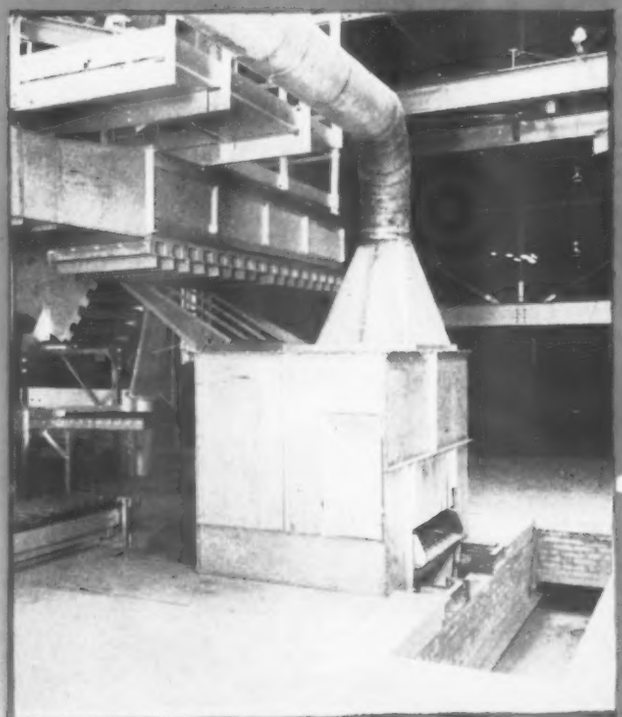
Side hoods located on the two long sides of large shakeouts may permit reduction in total exhaust volume required. Space between hoods must be sufficient to allow ready access for casting or flask.



Side hoods can be employed at the casting removal station with complete enclosures for the drag shakeout. This picture shows an automotive foundry.



This unusual modification to the overhead hood design retains the advantages of such a hood but allows complete freedom of handling from monorail.



In the mechanized foundry, the overhead hood forming an almost complete enclosure, will provide a dust free shakeout operation.

AAF

*Roto-Clone is the registered trade-mark for a Dynamic Precipitator or Hydrostatic Baffle-type Wet Collector.

ROTO-CLONE

DUST CONTROL SYSTEMS

USE THIS CONVENIENT COUPON

AAF American Air Filter Co., Inc.
266 Central Ave., Louisville 8, Ky.

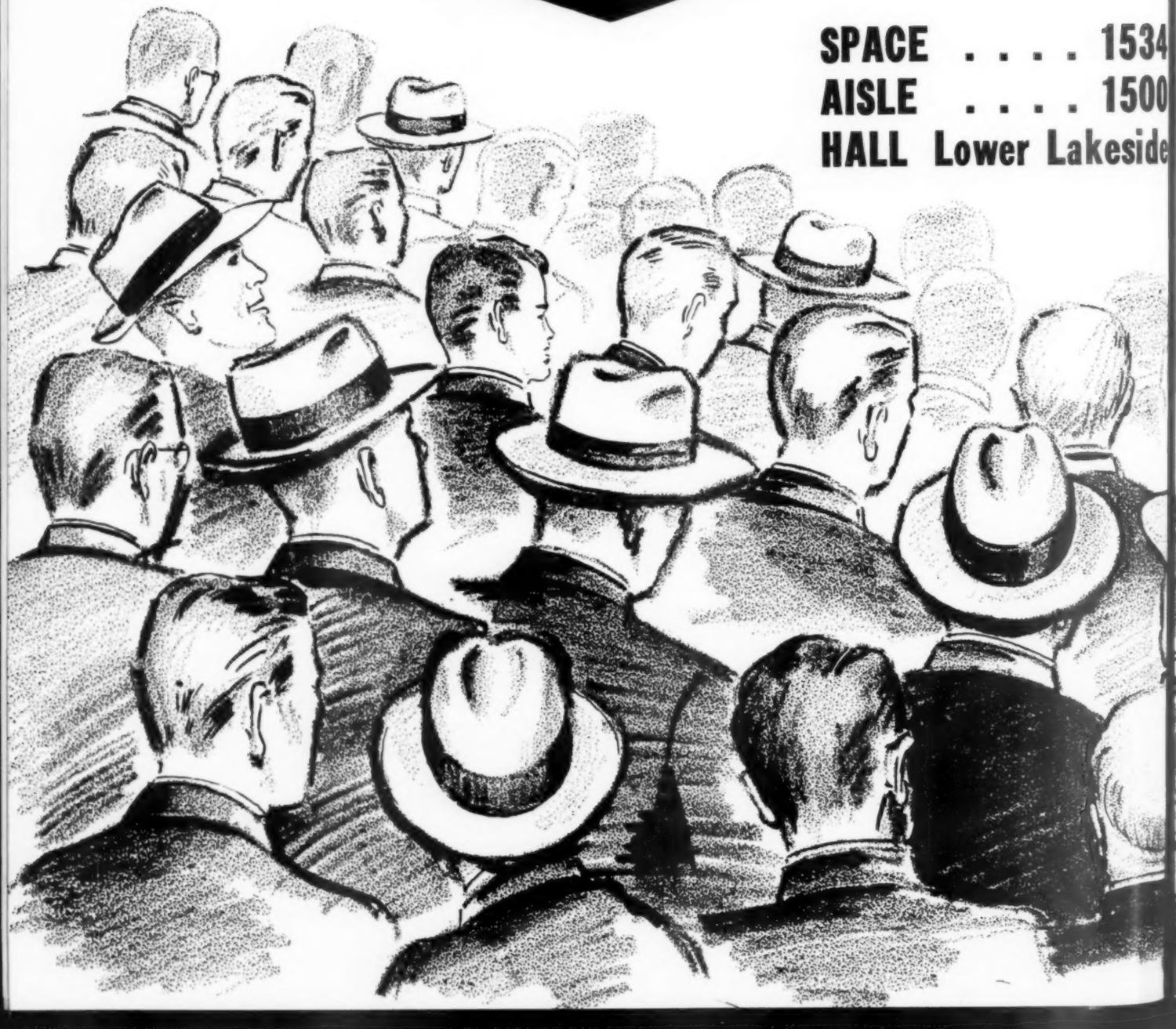
Gentlemen: Please send me data on Roto-Clone applications for all foundry dust problems.

Name .....

Company .....

Address .....

AJAX

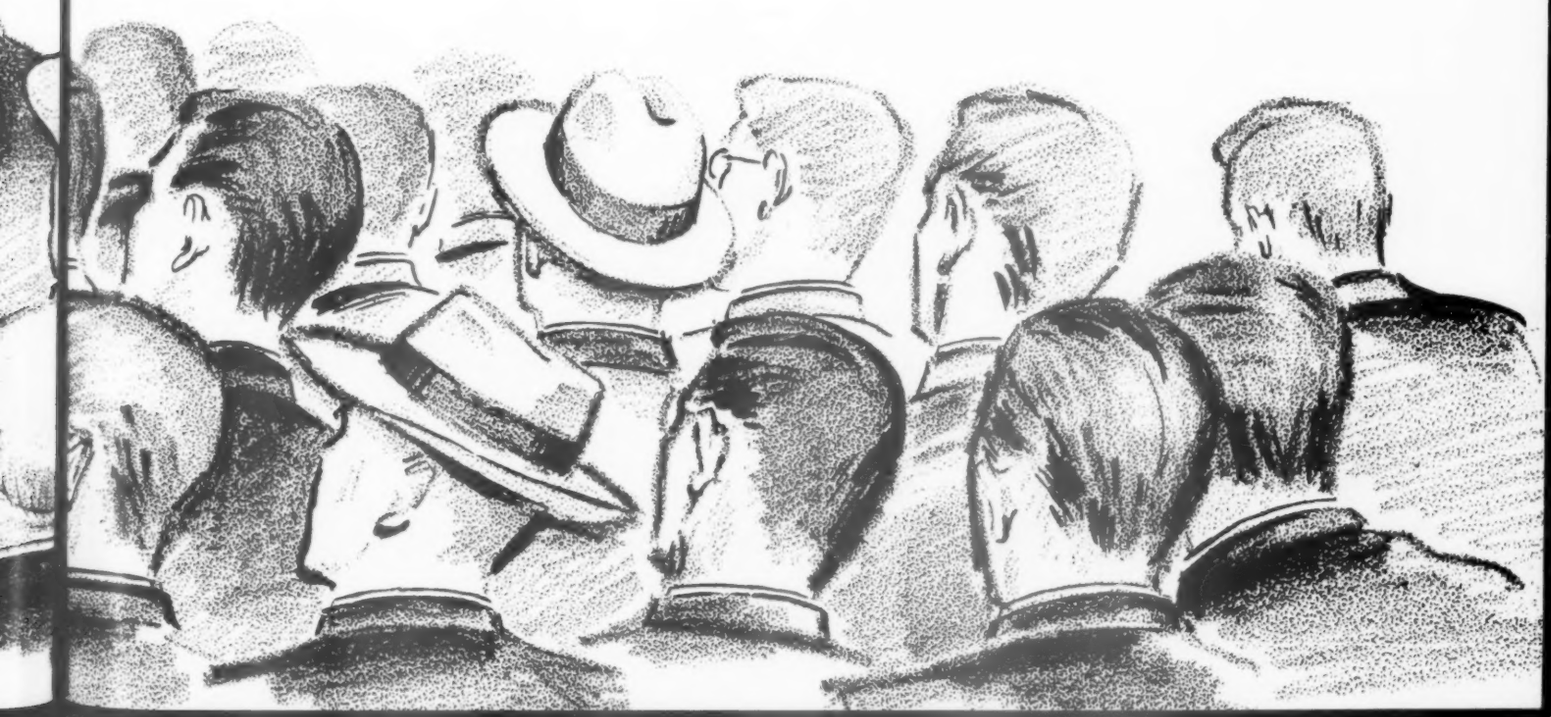


SPACE 1534
AISLE 1500
HALL Lower Lakeside

has something worth looking at

When you visit the Foundry Show, see how Ajax Lo-Veyors simplify, speed up and cut costs of sand handling. You will see a working display which eliminates continual shovel and wheelbarrow work. It will help make your foundry a better place in which to work.

AJAX FLEXIBLE COUPLING CO. INC., WESTFIELD, N. Y.



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CHILL KOOLHEAD NAILS
COLD FINISHED HOT FORGED

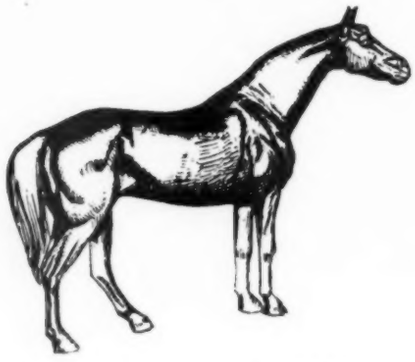
CARRY A HORSE SHOE NAIL FOR LUCK

WE INVITE YOU TO VISIT

BOOTH 413

GOLDEN JUBILEE FOUNDRY SHOW

CLEVELAND MAY 6-10, 1946

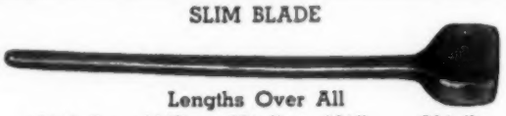


"For the want of a NAIL,
the shoe was lost.
For the want of a shoe,
the horse was lost.
For the want of a horse,
the rider was lost.
For the want of a rider,
the battle was lost.
For the want of the battle,
the kingdom was lost.
All for the want of a
HORSE SHOE NAIL."

GIANT HEAVYWEIGHT HEAD

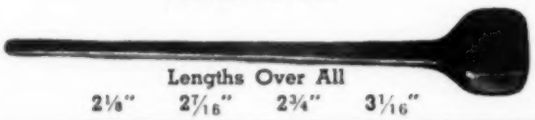
3 1/16" Long

SLIM BLADE



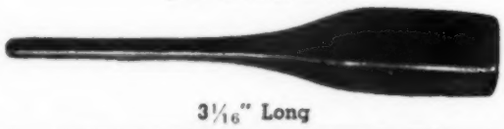
Lengths Over All
1 1/16" 2 1/8" 2 7/16" 2 3/4" 3 1/16"

MEDIUM BLADE



Lengths Over All
2 1/8" 2 7/16" 2 3/4" 3 1/16"

JUMBO PATTERN

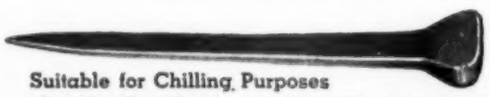


3 1/16" Long

HORSE NAIL BLADE

Lengths Over All
2 1/8" 2 3/8" 2 5/8" 2 7/8"

HORSE NAIL SECONDS



Suitable for Chilling Purposes
But Not For Shoeing — Sizes No. 5 to No. 11

HORSE NAIL STUBS

Made in Lengths
1" 1 1/2" 2"

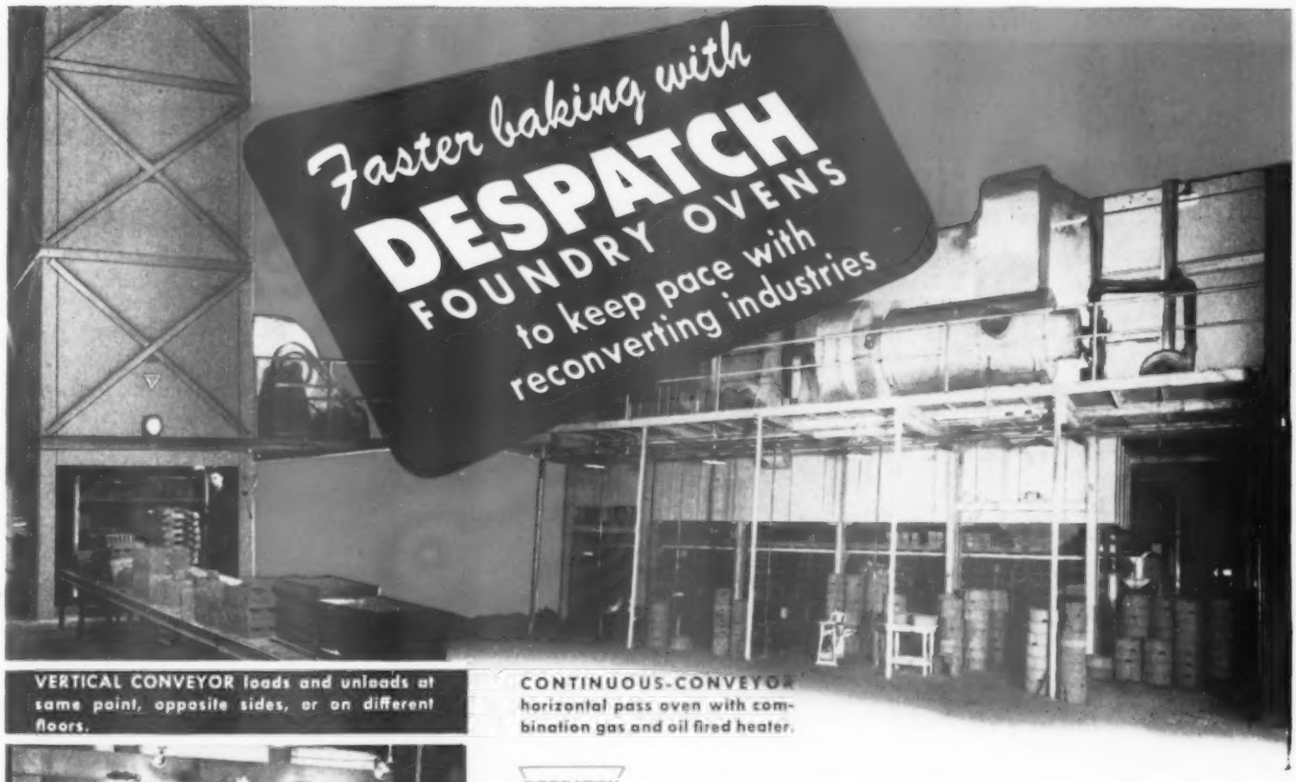
STANDARD HORSE NAIL CORPORATION STEEL Stanho PRODUCTS

ALSO ON DISPLAY BOOTH 413

- **WOODRUFF KEYS**
- **MACHINE KEYS** (All Types)
- **TAPER PINS**
- **STRAIGHT PINS**
- **COTTER PINS**

1947 Will Be Our Diamond Anniversary Year.
75 Years of Continuous Operation.

STANDARD HORSE NAIL CORPORATION
NEW BRIGHTON *Since 1872* PENNSYLVANIA



VERTICAL CONVEYOR loads and unloads at same point, opposite sides, or on different floors.

CONTINUOUS-CONVEYOR horizontal pass oven with combination gas and oil fired heater.

BATCH TYPE. Best all-around oven for the average foundry. Bakes cores and molds of all sizes.

DRAWER TYPE. Used for production, special rush jobs or test baking. Very flexible.

CAR-LOADED Core-Baking Oven for large, heavy cores and molds. Forced convection heated.

DESPATCH BUILT

"Pace-setter of the modern foundry," DESPATCH Ovens are *out in front* on reconversion schedules. From coast to coast they are producing more cores *faster*—without baking rejects. And here are some of the additional advantages of DESPATCH Foundry Ovens which will help beat your expanded casting quotas:

Automatic operation . . . efficient use of floor space . . . easy loading . . . economy . . . great flexibility . . . rugged construction . . . long dependability . . . easy installation.

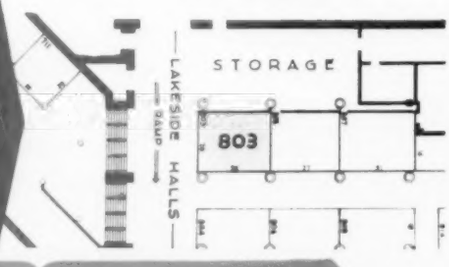
Forced Convection Heat Shortens Baking Time

From the smallest batch oven to the largest conveyor size, DESPATCH Foundry Ovens use time-tested forced convection heat—with up to 75% recirculated air—to shorten baking time.

Call DESPATCH and let the largest engineering staff in the industry—with 44 years of specialized foundry experience and "know-how"—analyze your foundry problems. They will recommend the type of oven best suited to your present reconversion needs and your future requirements.

ALL TYPES • ALL SIZES • ALL FUELS

VISIT DESPATCH BOOTH 803 AT THE FOUNDRY SHOW, MAY 5-9, CLEVELAND



DESPATCH OVEN COMPANY MINNEAPOLIS 14 MINNESOTA, U.S.A.

HERE'S HOW TO HANDLE CORE SAND

faster and easier

You can cut 14 hours' time from hand shoveling during the unloading of a 75-ton car of core sand . . . with the speedy Tote-All portable conveyor. This savings in time means a savings in money and equipment.

Foundries use the Tote-All for handling annealing coal, too . . . it saves time and makes the work easier for the men. With the Trail-Hoist foundries can use the Tote-All anywhere in the foundry. One man can easily move the conveyor around . . . and hydraulic lifting device raises delivery end of conveyor to desired height—easily and quickly.

Tote-All

PORTABLE POWER CONVEYORS

Only This Tote-All Conveyor gives you these superior features

- √ **Two convenient lengths—14 ft. and 20 ft.**
- √ **Demountable power unit—mounted above conveyor— adjustable to keep engine level in all conveyor positions.**
- √ **Gasoline or electric power unit optional.**
- √ **Variable speed pulley drive—10 in. belt.**
- √ **Belt speeds up to 420 ft. per minute.**
- √ **Flanged sides or sliding hopper to meet your requirements.**

See the Tote-All exhibit in Booth 418 at the Foundry Show in Cleveland May 6-10

COALTOTER CONVEYOR CO.
(NOT INC.)
310 S. MICHIGAN AVE., CHICAGO 4, ILL.

Engineered

PERFORMANCE

ALLBOND
100%
BOND

CEREAL CORE BINDER

You're cordially invited to visit us in Booth 423 at the Cleveland Show. We'll be just to the right of center as you enter from the East.

Scientifically controlled, and developed thru the combined efforts of the research facilities of the Battelle Memorial Institute, and the Lauhoff Grain Co. Samples of competitively superior Allbond Core Binder are available for demonstration by our metallurgical staff.

LAUHOFF GRAIN CO.

DANVILLE • ILLINOIS

LAUHOFF GRAIN CO., Danville, Illinois F
Please send me a FREE copy of your book "Foundry Core Mixes and Specifications."

Name.....

Position.....

Firm Name.....

Address.....*State*.....

City.....

Mr. J. Solomon States...

Union Steel Castings
DIVISION OF BLAW KNOX COMPANY
Pittsburgh 1, Pa.

November 21, 1945

BLAW KNOX COMPANY

Mr. R. C. Johnson, Sales Manager
Simplicity Engineering Company
Durand, Michigan

Dear Sir:

We are glad to give you information concerning the operation of the Simplicity Quad and Dual shake-outs in our foundry.

These machines have been in service more than three years shaking out molds from castings ranging in weight from 100 pounds to 40 tons. We have found them to be very efficient, with a maintenance cost that is practically negligible.

You may use this information together with the name of our company and writer in any way you see fit.

Very truly yours,
UNION STEEL CASTINGS
J. Solomon
J. Solomon
Asst Works Manager

JS/ms

MEMBER
MANUFACTURERS ASSOCIATION INC.
FOUNDRY EQUIPMENT

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY
DURAND, MICHIGAN

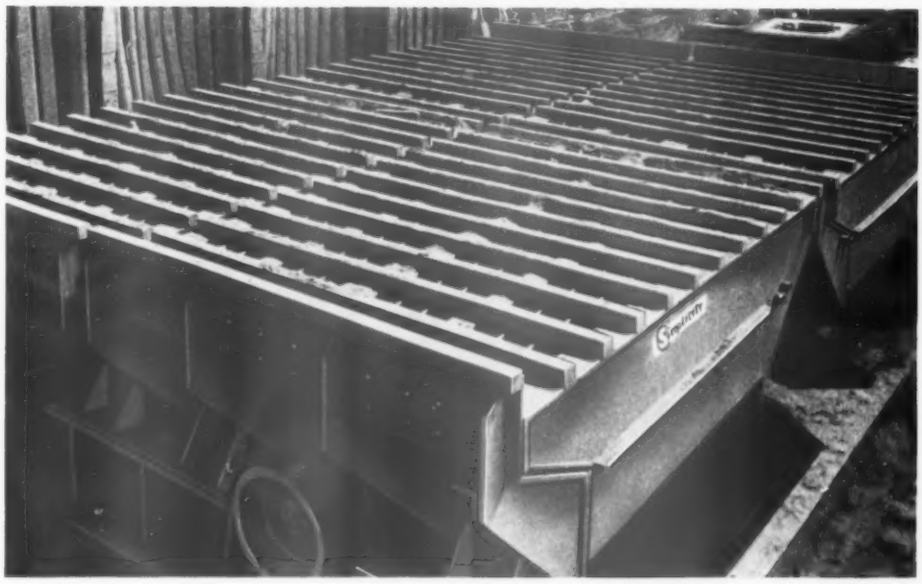
Simplicity QUAD and DUAL SHAKE-OUTS

Are very efficient and are operating with a maintenance cost that is practically negligible.

★

100% Vibrating Deck Area Quad Shake-Out, at Union Steel Castings Pittsburgh, Pa. Area 12'-2"x17' Capacity 50 Tons Plus

★



SIMPLICITY QUAD SHAKE-OUTS were built as early as 1937 with the first unit still in operation every day. This shake-out unit is car mounted and was designed to handle forty ton loads. However, loads up to 170,000 pounds have been consistently shaken out during the past five years without producing any maintenance costs.

Quad Shake-Outs have been built in sizes ranging from 10′ x 10′ to 15′ x 22′ in vibrating area. Special deck areas can be supplied for special jobs. The positive blows struck against the flask or casting by the massively constructed vibrating units assure fast and certain movement of the sand, no matter how hard it is baked.

Our engineering representatives will check your job and recommend the proper equipment.

"VISIT OUR DISPLAY - SPACE 1403 LOWER LEVEL."

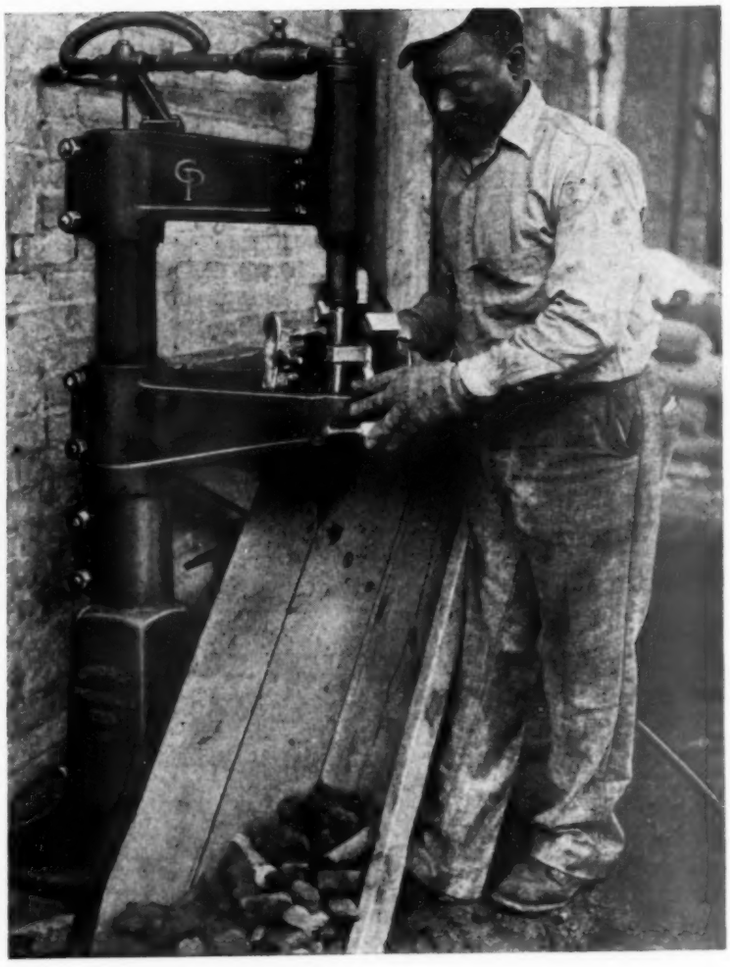
Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY
DURAND, MICHIGAN

CP CORE KNOCK-OUT MACHINE

for Aluminum, Bronze and Malleable Foundries

at THE FOUNDRY SHOW—Booth 834



Four times the Output

of conventional portable air chipping hammer methods, with much less operator fatigue

OPERATED by compressed air at ordinary shop pressures, its action is that of a combination air vise and vibrator. The core sand is loosened and flows out in a few seconds. Speed and sharpness of vibration are readily adjusted for different types of castings. Furnished in three models of different capacities. Write for complete data.

Also on exhibit in Booth 834

Type Y "Package Type" Air Compressor

Sand Rammers
Core Breakers
Chipping Hammers
Portable Grinders

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

SUPER CYCLE . . . ANOTHER FIRST BY

CHICAGO PNEUMATIC . . . WORLD'S FASTEST LIGHTEST PORTABLE

HIGH FREQUENCY ELECTRIC TOOL

Remove more metal—At less cost

with the new

CP SUPER CYCLE GRINDER

***demonstrated at the* FOUNDRY SHOW—Booth 834**

MILESTONES IN THE DEVELOPMENT OF PORTABLE TOOLS

1904

FAN for cooling motor

1908

UNIVERSAL AC-DC motor

1916

COMPOUND COMPENSATED DC motor

1924

HICYCLE 180 cycle induction motor

1945

SUPER CYCLE 360 cycle induction motor

All were originated by Chicago Pneumatic

BECAUSE a fast portable tool motor can be lighter and produce greater power than a slow motor, CP engineers have developed Super Cycle (360 cycle, 3 phase, 220 volt) induction motor tools, with a rotor speed of 21,600 RPM. Under full load these new CP Super Cycle electric tools slow down only 5%.

This 6-inch Super Cycle Grinder weighs only 3 pounds per horsepower. It is easier to handle, can be located on the work more quickly, and is less tiring to hold than tools with slower motors.

Maintenance is remarkably low, as Super Cycle tools have no brushes to replace and no armatures to burn out. The great saving in motor weight permits the use of stronger and more durable gears, housings, bearings and other mechanical parts.

CP Super Cycle Grinders are available in a complete range of sizes, with 1-inch to 8-inch wheel capacities

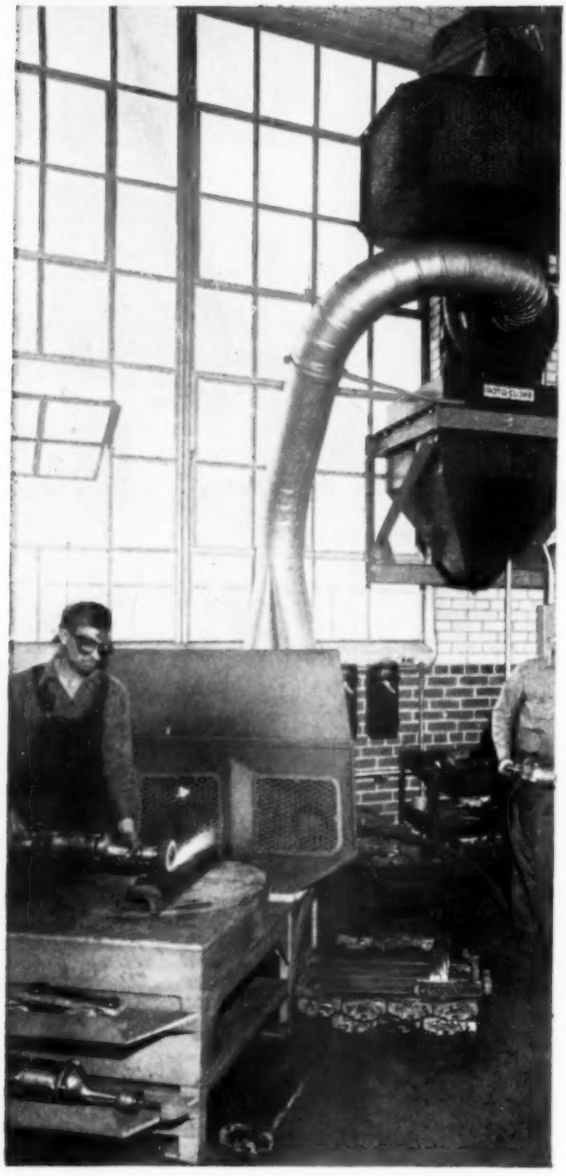
★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

DUST CONTROL that's *RIGHT* on the job



. . . engineered by KIRK AND BLUM

● When dust is not adequately controlled, every element of production is affected—the health and working capacity of employees, the quality and quantity of your output, the length of life of machinery and other equipment.

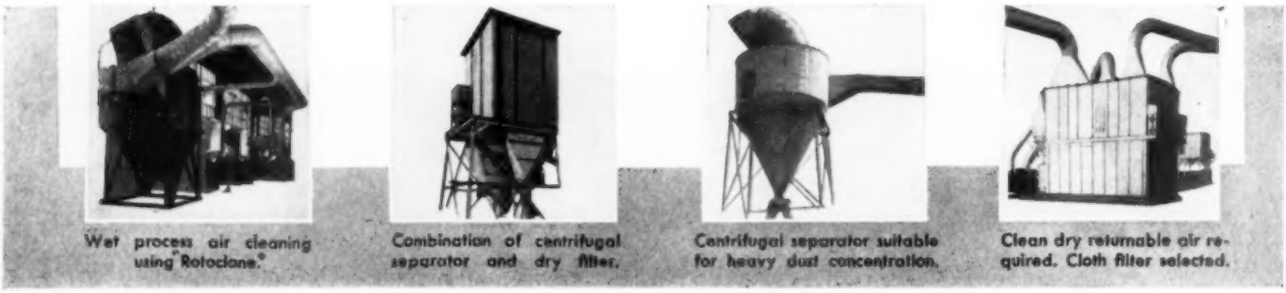
Kirk & Blum Dust Control is RIGHT on the job—*engineered* to meet your individual plant needs. Backed by 39 years of specialized experience, every K & B installation—whether a completely new system or a remodeling of existing facilities—is guaranteed to give you maximum dust control at minimum operating cost.

It will pay you to thoroughly investigate the services rendered by Kirk & Blum Air Engineers. For details, write us at the address below.

SEND FOR BOOKLETS

Dust Collecting Systems in Metal Industries
Fan Systems for Various Industries
Blower Systems for Woodworking Plants
Industrial Ovens
Cooling Systems for the Glass Industry
Data on Kirk & Blum Production Facilities

The KIRK & BLUM MANUFACTURING *Co.*
8 SPRING GROVE AVE. CINCINNATI 25, OHIO



Wet process air cleaning using Rotoclone.

Combination of centrifugal separator and dry filter.

Centrifugal separator suitable for heavy dust concentration.

Clean dry returnable air required. Cloth filter selected.

HOW TO MAKE OR CHECK A CORE BOX WITH HYDROCAL

Now all pattern shops can take advantage of the extra accuracy and speed, the profitable economy offered by Hydrocal Gypsum Cements. For in these two up-to-the-minute bulletins, prepared especially for the pattern industry, are the complete essentials on checking a core box by the "booking" method and on making a core box.

Each step is carefully explained and there are many actual photos and detailed diagrams to make the procedure even easier.

Send for your copies now and learn first-hand about Hydrocal Super Strength Gypsum Cements, the best material for making or checking a core box.

Hydrocal is a trademark Reg. U. S. Pat. Off., for a super-strength Gypsum Cement manufactured by United States Gypsum Company

FREE!
Mail Coupon For LATEST BULLETINS TODAY

UNITED STATES GYPSUM COMPANY
Dept. F-5-46, Chicago 6, Illinois

Gentlemen: Please send me a copy of your new bulletins, ☐ How to Make a Core Box with Hydrocal Gypsum Cement; ☐ How to Check a Core Box with Hydrocal Gypsum Cement.

Name.....

Address.....

City..... *Zone*..... *State*.....

United States Gypsum

For Building • For Industry

Gypsum • Lime • Steel • Insulation • Roofing • Paint

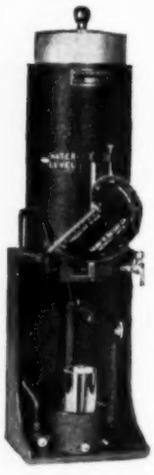
Do you want to save Time . . . . . and Money?

CONTROL EQUIPMENT PAYS

MOISTURE TELLER

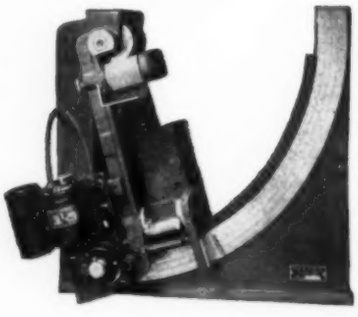
Will dry a fifty gram sample of high permeability in one minute by forcing electrically heated air through the test sample. Test is in exact moisture percentage by gravimetric method. No corrections or calibrations are required. Operating cost is very low.

PERMEABILITY METER



It is possible to make an accurate permeability reading within 15 seconds with the Permeability Meter. Used for measuring green, dry and baked A.F.A. Permeability of molding sands, sharp sands, cores and other granular materials. Use permeability meter for both daily control and for research tests to improve sand conditions in the foundry or for permeability control of other materials.

UNIVERSAL SAND STRENGTH MACHINE WITH MOTOR DRIVE



The universal sand strength machine with motor drive provides a strength testing machine for the laboratory that will perform a large variety of strength tests on molding sands, clays, cores and other materials. A sturdy and reliable unit from which accurate results may be obtained with the least amount of effort.

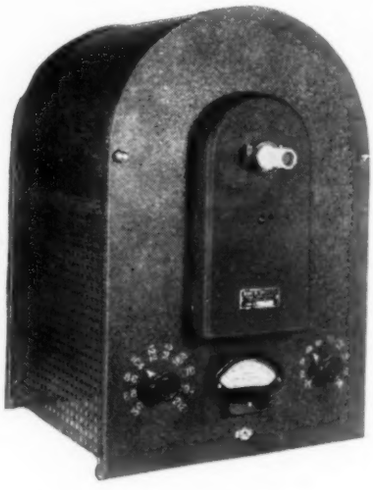
★

2 MINUTE CARBON DETERMINATOR

The improved 2 Minute Carbon Determinator enables operator to determine either preliminary or final carbon content of all metals with speed and accuracy. New features eliminate much of the human equation and simplify procedures. Complete determination can be made within 2 minutes after sample is weighed. A 2 minutes Sulphur Determinator is also available.

★

VARITEMP COMBUSTION FURNACE



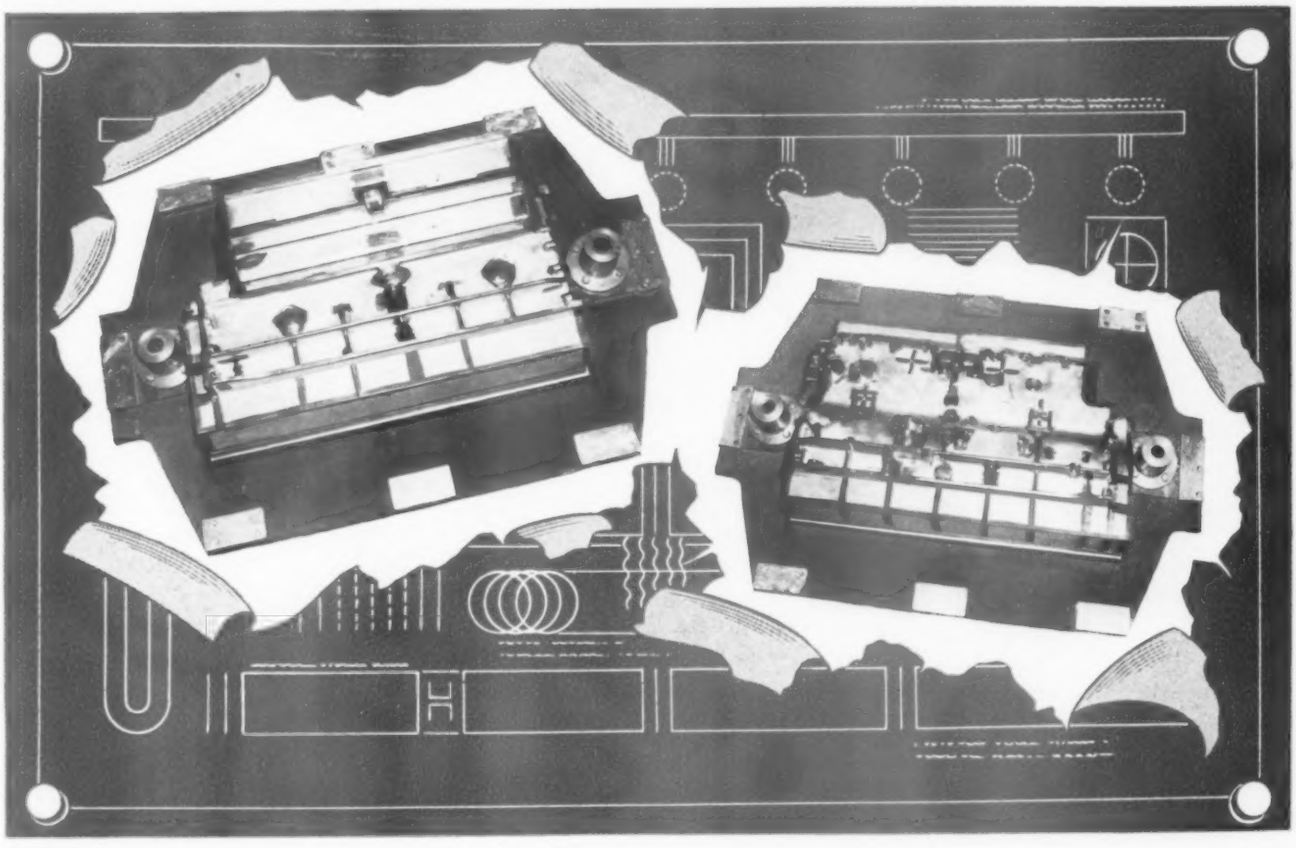
The unique construction of the Varitemp Combustion Furnace combines transformer, pyrometer, oxygen valve, voltage control switches, power switch and furnace in a single unit. Constant Temperature assured. All parts well protected for maximum efficiency. Temperature range up to 2750 deg. Fahr. Single Tube Furnace. $177.00 . . . Double Tube Furnace, $230 F.O.B. Detroit.

CONTROL EQUIPMENT SAVES TIME

Harry W. Dietert Co.

9330 ROSELAWN • • • DETROIT 4, MICH.

ANOTHER *Buffalo* PRECISION PATTERN

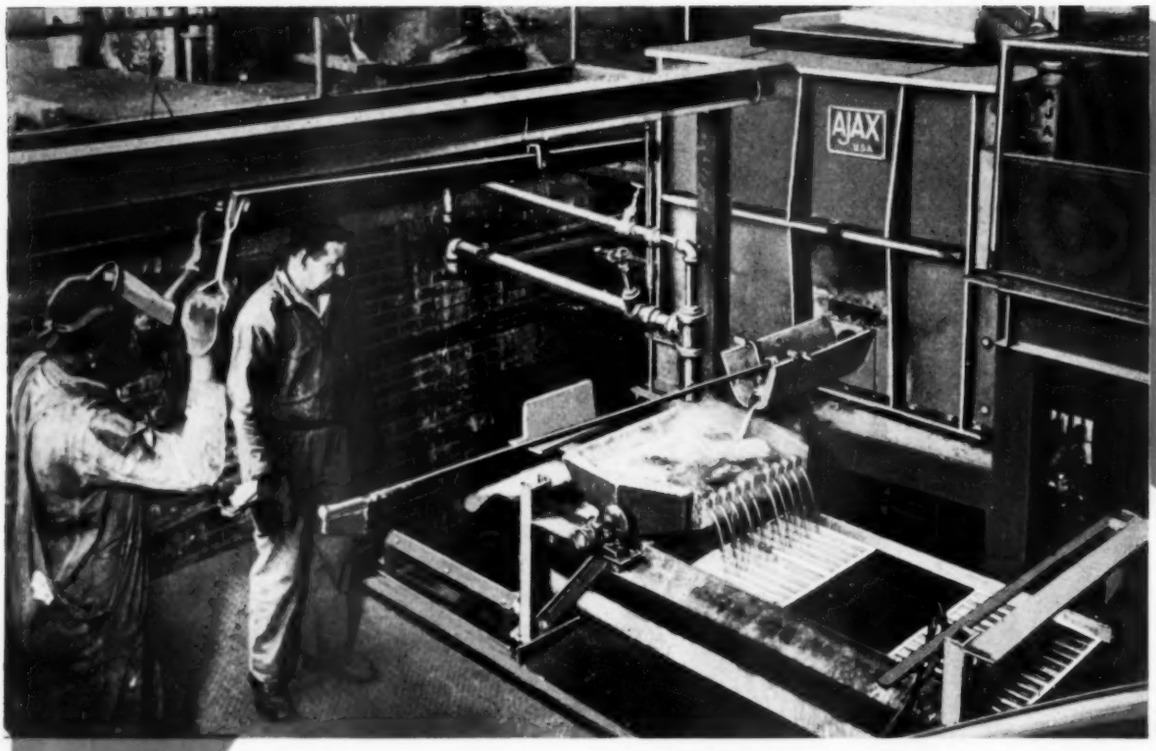


This *1947* Six Cylinder Block Just Completed For A Leading Automobile Manufacturer

The above patterns are brass machined all over, mounted on mechanite stool plates, photographed just before being shipped. Here is another fine example of "Buffalo's" ability to serve the most intricate pattern requirements of leading manufacturers. The big reason behind "Buffalo's" more than fifty years of success in precision pattern making is a complete knowledge of metals, structural design and practical fabrication. We invite you to consult "Buffalo" to have your next pattern "Precision Made".

BUFFALO PATTERN WORKS

830 HERTEL AVENUE • BUFFALO 16, NEW YORK



Photograph courtesy of Tomke Aluminum Co., Baltimore, Md.

First Electric Furnace in the Aluminum Ingot Industry

THE photograph shows a 250 kw. low frequency Ajax-Tama-Wyatt induction furnace, the first of its kind to be used in the aluminum ingot industry. Designed to discharge 10,000 pounds of ingot metal, it is in continuous (24 hour) operation, reconverting war time metal into ingots for peace time production.

Aluminum alloys are known to pick up gases only in the molten state at higher temperatures, which are not reached in the induction furnaces. Ingots manufactured in these units, are therefore prepared under the most suitable conditions for prevention of gas absorption.

Exhibiting at the FOUNDRYMEN'S CONVENTION, Cleveland, Ohio, May 6-10. Booths 514-520

AJAX ENGINEERING CORPORATION
Trenton 7, New Jersey

5 SPECIAL FEATURES

1. Capable of continuous operation.
2. Increased lining life and reduced maintenance cost.
3. Accurate temperature control allows casting consistently at lowest and most adequate temperatures necessary for sound castings. Result: fewer rejects.
4. Reduction or elimination of gas pickup.
5. Improved working conditions.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

Associate Companies: AJAX METAL COMPANY, Non-Ferrous Ingot Metals and Alloys for Foundry Use
AJAX ELECTROTHERMIC CORP., Ajax-Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax-Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

Visit Us at the Foundry Show!

THE USE OF AJAX PHOSPHOR-COPPER

Send for booklet
"INGOT METALS OF TODAY"

●

15 STANDARD ALLOYS BY AJAX

Ajax Tombasil
Ajax Plastic Bronze
Ajax Anti-Acid Bronze
Ajax Phosphor Bronze
Ajax Red Brass Ingots
Ajax Manganese Bronze
Ajax High-Tensile Manganese Bronze
Ajax Golden Glow Yellow Brass
Ajax Nickel-Copper 50-50%
Ajax Manganese Copper
Ajax Aluminum Alloys
Ajax Phosphor Copper
Ajax Silicon Copper
Ajax Nickel Alloys
Ajax Phosphor Tin

NOTE

*"Proper Melting Decreases Foundry Losses," contains interesting data. Also, the booklet, "Nonferrous Ingot Metals of Today." Write for both of these. They are free.

Successful foundrymen deoxidize or "clean up" molten metal by a scientific method worth using *as indicated:*

They use phosphorus . . expertly . . in the form of "Ajax Phosphor Copper" . . added as the crucible is removed from the furnace . . for virtually all brass and bronze alloys.

In notched waffle sections, or in shot form, Ajax 15% P-Cu does its work at .01% (1 oz. per 100 lbs.). Introduced, and having time to react when stirred with a whirling motion of the skimmer, it causes oxides to rise for effective removal by skimming from the surface. It is best to avoid phosphorus build-up from back stock.* . . If you use phosphorus these days, use Ajax Phosphor Copper (useful also in producing your phosphor bronze)

THE **AJAX METAL COMPANY**
ESTABLISHED 1880
PHILADELPHIA

ASSOCIATE COMPANIES:
AJAX ELECTRIC FURNACE CORPORATION, *Ajax-Wyatt Induction Furnaces for Melting*
AJAX ELECTROTHERMIC CORPORATION, *Ajax-Northrup Induction Furnaces for Melting, Heating*
AJAX ELECTRIC COMPANY, INC., *Electric Salt Bath Furnaces*
AJAX ENGINEERING CORPORATION, *Ajax-Tama-Wyatt Aluminum Melting Furnaces*

·HIGH SILICON IRON·

JISCO

JISCO SILVERY—CONTAINS SILICON

A BLAST FURNACE PRODUCT—REFINED

LADLE MIXED—UNIFORM

MADE FROM VIRGIN ORES—PURE

CONTAINS NO FOREIGN MATTER—CLEAN

5 REASONS WHY JISCO IMPROVES YOUR CASTINGS

The distinguishing traits in the character of General Jackson, as a military commander, were clear - headed sagacity, promptness of decision, and rapidity of execution. He had no sooner resolved on the course which he thought necessary to be pursued, than he hastened with all possible dispatch, to secure its completion.

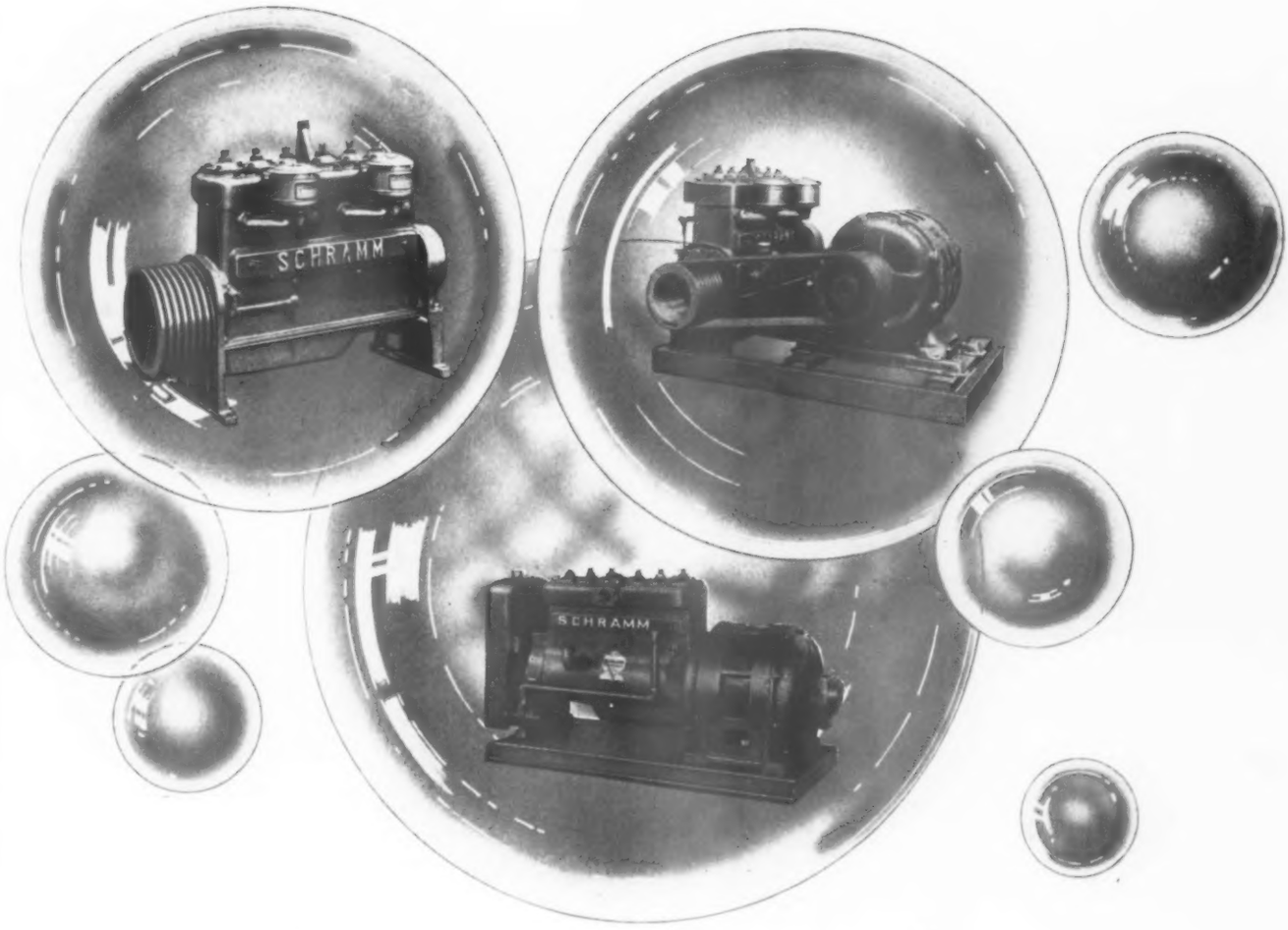
The addition of JISCO Silvery to your gray iron scrap and other melting stock yields a sound metallurgical product. Castings "seasoned" with JISCO have fine grain, uniform structure, greater strength and toughness and better machinability. JISCO is a "must" in modern foundry practice.

The Services of Our Metallurgical Department Are at Your Command

We maintain this department for the benefit of the foundryman. You are not obligated in requesting our co-operation.

THE JACKSON IRON & STEEL Company

JACKSON, OHIO.



packaged air

is more than a pipe dream. SCHRAMM COMPRESSORS, for example, package air every day for industrial consumption. The superior features of SCHRAMM COMPRESSORS have earned this company the privilege of again supplying the air at the AFA exhibits in Cleveland. Naturally, we are proud of this distinction. Features that influenced the selection of SCHRAMM AIR COMPRESSORS are: (1) 100% water cooled; (2) forced feed lubrication; (3) mechanical intake valve; (4) compact, lightweight. All these features are designed for heavy duty, continuous service and minimum attention. There's a SCHRAMM AIR COMPRESSOR for your every need, in sizes ranging from 2 to 600 cubic feet displacement.

*

AIR FOR THE AFA EXHIBITIONS AT THE CLEVELAND CONVENTION AGAIN SUPPLIED BY SCHRAMM

SCHRAMM INC.
COMPRESSOR SPECIALISTS
WEST CHESTER, PENNSYLVANIA

SEE HERE... *the modern*

DRILLS—Powerful, lightweight tools with drilling capacities from 3/16" to 3" diameter.

CHIPPING HAMMERS—Available in Sleeve, Plate, Spool or Cylinder valve types with strokes from 3/4" to 4".

CORE BUSTERS—Fast, powerful tools for light, medium or heavy duty service.

At the show, inspect these modern Thor portable pneumatic and electric tools that can help you increase production and cut costs. You'll see how Thor's fifty years of quality tool-making brings you everything you want in power tools; maximum power, light weight, perfect balance, instant starting, smooth operation, positive control and rugged construction. All Thor Tools for foundry operations are made in a wide range of sizes and styles to meet your exact needs.

- *For full specifications on Pneumatic Tools of all types, ask for Catalog No. 52B.*
- *For full specifications on Portable Electric Drills and Screwdrivers for Pattern Shop use, ask for Catalog No. 38.*

INDEPENDENT PNEUMATIC TOOL CO.
600 W. Jackson Blvd., Chicago 6, Ill.

Birmingham Boston Buffalo Cleveland Detroit Los Angeles Milwaukee New York Philadelphia Pittsburgh St. Louis Salt Lake City San Francisco Toronto, Canada London, England

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

Thor tools

THAT MAKE TOUGH FOUNDRY JOBS EASIER!

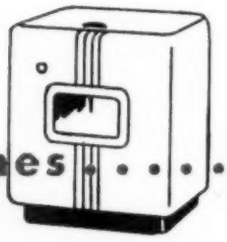
BOOTH 1430
AMERICAN FOUNDRYMEN'S CONVENTION
CLEVELAND, OHIO
MAY 6-10, 1946

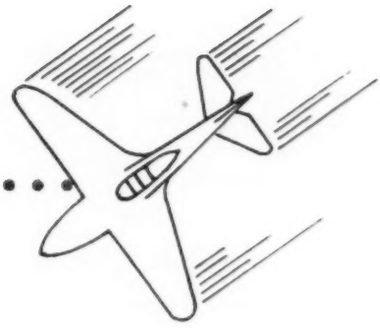
AIR HOISTS—Dependable motor hoists in models from ¼ ton capacity to 3 tons. Safe and sturdy they are economical to operate and maintain.

SAND RAMMERS—Both floor and bench types using butt or pein. Powerful and easy to handle, they provide dependable steady performance.

GRINDERS—A complete range of sizes in rotary grinders, sanders and wire brushes carefully graduated as to weights, lengths, speeds and wheel capacities for every job from snagging to fine finishing.

washing machines . . . . . planes . . . . .





each takes a different alloy

Ask Acme Engineers about the RIGHT ALUMINUM ALLOY for Your Job

More than 100 alloys of aluminum are available today, each with some special characteristics of its own. That is why selection of the RIGHT alloy for your particular aluminum casting job is so important.

So why not tell Acme engineers about the job your product or your part must perform. Let us know what strains it must meet—what corrosion it must resist—what impacts it must withstand. Then we can suggest the right alloy for your purpose—the alloy with the strength, the hardness, the elasticity that your aluminum casting requires.

Acme Aluminum Alloys, Inc. has had wide and long experience in working with aluminum and its alloys, and has recently acquired the Cooper Metallurgical Laboratory of Cleveland. Thus, in the production of Acme Aluminum Alloy Castings the latest advances in metallurgical knowledges are accompanied by the most modern foundry techniques.

Tell us your castings needs, and get Acme recommendations, without obligation.

Visit Our Exhibit . . . Space 402 . . . A. F. A. Convention, Cleveland, Ohio

ACME ALUMINUM ALLOYS, INC.

DAYTON 3, OHIO

Patterns · Tools · Aluminum, Brass, Bronze Castings · Engineering

SALES OFFICES: New York Chicago Cleveland
Pittsburgh St. Louis Washington Minneapolis Flint Milwaukee Denver Dallas

Industry Salutes AFA On Fiftieth Anniversary

THE American Foundrymen's Association will meet in Cleveland from May 6 to 10 to review recent technical progress of the foundry industry, to chart a course for future activities, and to celebrate the fiftieth anniversary of the founding of the association. As is usual with AFA conventions, the 1946 gathering will be replete with many interesting and valuable features, including technical sessions covering all phases of foundry practice, informal round-table discussions and shop operating courses where practical experiences can be exchanged, committee meetings where the basic work of the association can be planned, a mammoth exhibition of foundry equipment and supplies, and a variety of social events. The Northeastern Ohio Chapter of the AFA will welcome the visitors, and the mayor of Cleveland has proclaimed May 6 to 10 as Foundry Week in that city.

Potentials for a most successful convention and exhibition are great. The association has not staged a technical meeting since 1944, so that more than the normal amount of developments should be included in the discussions. Also, most of the wartime security restrictions have been lifted, so that the program may include consideration of the entire field of wartime progress in castings. Demands of war production kept equipment manufacturers from introducing improvements and developing new machines for foundries, but much work has been done since the ending of the war, and the Cleveland show will reveal considerable progress in that direction.

To many the Golden Jubilee celebration, marking the completion of 50 years of service to a basic industry, holds great interest. Much progress has been made in the foundry industry since the small group of men gathered in Philadelphia in 1896 and organized the American Foundrymen's Association. All who have served the association during the past half century as officers, members of committees, author of papers, at the national headquarters offices, or in many other ways, should take great pride in the many accomplishments of the association, and in the influence of these attainments on methods of production and improvements in properties of modern castings.

As the AFA looks back with considerable satisfaction on a half century of constructive work, it also should approach the future with great confidence. Opportunities for service to the industry are as large today as at any time in the past. The war has proved to foundrymen, engineers and the buying public that castings are basic engineering materials in almost all types of production. At the same time, foundrymen recognize the need for further improvements in product and methods of production. With the largest membership in its history functioning through 32 chapters, the association has its greatest opportunity for service.

THE FOUNDRY joins with the entire foundry industry in congratulating the American Foundrymen's Association on its fiftieth anniversary, and wishing the organization even greater success in the years that lie ahead.

Frank G. Steinebach
Editor

A.F.A TO MEET for Golden Jubilee

FIFTY years have elapsed since the American Foundrymen's Association was formed following a meeting in Philadelphia to establish a national technical organization in the foundry industry. The convention to be held in Cleveland May 6 to 10, marking the golden jubilee of that event, also will be the first national gathering since 1944 and will be the first opportunity since 1940 for a full operating display of foundry equipment.

From the standpoint of technical developments in both foundry practices and facilities for foundry operations, the 1946 event gives promise of offering worthwhile information at both the technical sessions to be held during the week and at the Foundry Show likewise scheduled for the five days from Monday through Friday. Headquarters for both the convention and exposition will be maintained in the Cleveland Public Auditorium, where the technical and business sessions are to be held. No hotel has been designated headquarters during the Foundry Week.

Program of the convention, shown in detail starting on page 136 of this issue, provides a full week of technical sessions. Each of the AFA divisions will present a full complement of sessions dealing with foundry practice and metallurgy. The popular round-table meetings and shop operation courses again will be offered, and the annual lecture course, so well attended in 1942, 1943 and 1944, will be a feature of the 1946 program. In addition, the committees on foundry costs, casting defects, inspection, sand resarch, apprentice and foreman training, job evaluation and time study, plant equipment, and safety and hygiene have arranged interesting programs.

No stranger to the role of convention host, Cleveland wil be entertaining the AFA for the seventh time. Only Chicago has served as the convention city this often. Previous national gatherings in Cleveland were in 1942, 1938, 1930, 1923, 1916 and 1906. No other industrial city in the United States combines the adequate facilities for large-scale exhibit space and meeting rooms with proximity to downtown hotels such as are afforded at Cleveland. Hotel accommodations, unfortunately, are limited by conditions peculiar to the times, but the convention housing bureau is making every effort to handle what will undoubtedly be one of the largest gatherings of foundrymen in history.

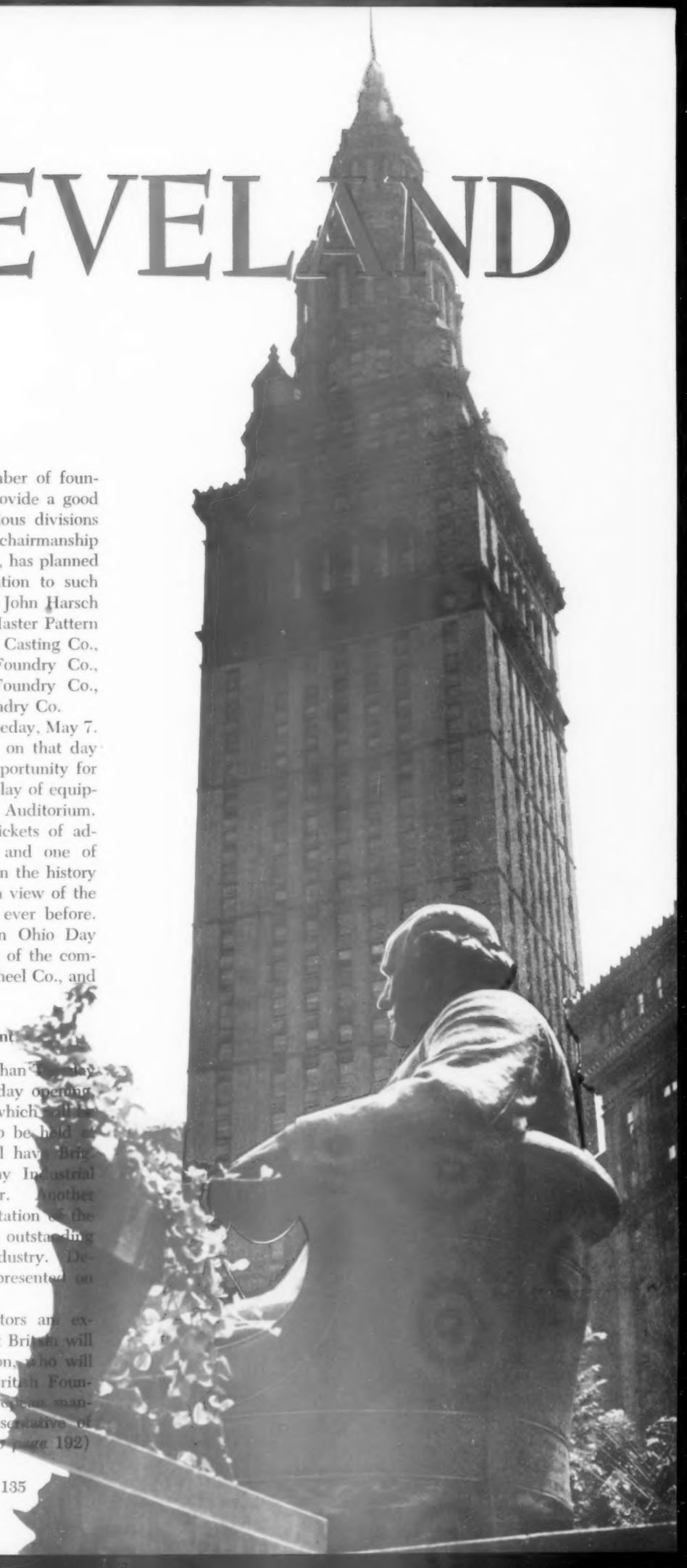
Recognizing the significance of the occasion and the important role played by the foundry industry in the industrial life of the city, Cleveland's mayor, Thomas A. Burke, has proclaimed the week of May 6 as "Foundry Week." The mayor's message appears on page 190.

Various committees of the Northeastern Ohio Chapter of the AFA have been active for weeks in arranging various details of the convention. These include, in addition to preparation for entertainment of ladies attending the convention, such functions as plant visitations, entertainment of foreign visitors, the annual banquet the evening of May 10, and Northeastern Ohio Day on May 7. Andrew C. Denison, president, Fulton Foundry & Machine Co., Cleveland, is president of the Northeastern Ohio Chapter, and general chairman of the committee in charge of convention activities. Other officers of the general committee are: Vice chairman, Henry J. Trenkamp, Ohio Foundry Co.; secretary, Gilbert J. Nock, Nock Fire Brick Co; treasurer, F. Ray Fleig, Smith Facing & Supply Co.

Registration of ladies attending the convention will start at 1 p.m. Sunday, May 5, on the mezzanine of Hotel Cleveland, where ladies headquarters will be maintained throughout the week. The ladies' entertainment program, directed by a committee under the co-chairmanship of Russell T. Lincoln and Mrs. Gilbert C. Nock, starts with a tea at Hotel Cleveland from 3 to 5 p.m. on Monday, May 6. Tuesday's main event will be a luncheon and style show at 1 p.m. at Halle Bros. Co.'s Steinway Hall. A theater matinee is planned for Wednesday, while a luncheon and entertainment is scheduled at 1 p.m. at Hotel Carter on Thursday. The ladies also will participate in the annual banquet to be held Friday evening at Hotel Statler.

Plant Visitation Committee of the Northeastern Ohio

IN CLEVELAND



Chapter has made arrangements with a number of foundries for inspection by visitors which will provide a good cross section of foundry practice in the various divisions of the industry. This committee, under the chairmanship of J. M. Price, Ferro Machine & Foundry Co., has planned visits for foundrymen attending the convention to such plants as Wellman Bronze & Aluminum Co., John Harsch Bronze & Foundry Co., Motor Pattern Co., Master Pattern Co., West Steel Castings Co., Crucible Steel Casting Co., Fulton Foundry & Machine Co., Bowler Foundry Co., Taylor-Boggis Foundry Co., Allyne-Ryan Foundry Co., Ferro Foundry & Machine Co. and Ohio Foundry Co.

Northeastern Ohio Day has been set for Tuseday, May 7. Exhibits of the Foundry Show will be open on that day from 1 to 10 p.m. in order to provide an opportunity for all foundrymen of the area to inspect the display of equipment and supplies at Cleveland Public Auditorium. Foundries of the district will be supplied tickets of admission for distribution among employees, and one of the largest attendances at the foundry show in the history of these exhibits is in prospect, particularly in view of the fact that more displays will be shown than ever before. Active in arrangements for the Northeastern Ohio Day program are the chairman and vice chairman of the committee in charge—Ed. M. Follman, Griffin Wheel Co., and Michael G. Thomas, City Foundry Co.

To Present Medals for Achievement

The show itself will be open on days other than Tuesday from 9 a.m. until 5:30 p.m., except for Monday opening, which will be 9:30 a.m., and Friday closing, which will be 4 p.m. Annual dinner of the association, to be held at Hotel Statler Friday evening at 7 p.m., will have Brig. Gen. Donald Armstrong, commandant, Army Industrial College, Washington, as principal speaker. Another feature of the dinner program will be presentation of the association's annual awards to individuals for outstanding contributions to promotion of the foundry industry. Details regarding recipients of the awards are presented on page 146 of this issue.

A relatively large number of foreign visitors are expected to attend the convention. From Great Britain will come a delegation headed by Tom Makemson, who will represent the president of the Institute of British Foundrymen, and including Vincent Delport, European manager of THE FOUNDRY and European representative of the AFA, as well as D. W. L. (*Please turn to page 192*)

CONVENTION *for Cleveland*

Monday, May 6

9:30 a.m.—Exhibits Open

12:00 m.—Aluminum and Magnesium Division Luncheon

Presiding, R. E. Ward, Eclipse Pioneer Division, Bendix Aviation Corp., Bendix, N. J. Co-Chairman—A. T. Ruppe, Bendix Products Corp., South Bend, Ind.

Report of Committee on Recommended Practices for Aluminum and Magnesium Die Castings, by J. C. Fox, Doehler-Jarvis Corp., New York.

Report of Committee on Recommended Practices for Aluminum and Magnesium Permanent Mold Castings, by A. Sugar, American Metal Co. Ltd., New York.

2 p.m.—Joint Meeting, Plant Equipment, Safety & Hygiene

Presiding, James Thomson, Continental Foundry & Machine Co., East Chicago, Ind. Co-Chairman, C. F. Guion, W. W. Sly Mfg. Co., Chicago.

Accident Prevention as a Function of Management, by R. R. Meigs, Liberty Mutual Insurance Co., Boston.

Mechanical Shakeouts, by J. L. Yates, Worthington Pump & Machinery Corp., Buffalo.

4 p.m. (A)—Lecture Course (Session 1)

Presiding, D. Basch, Almin Co., Schenectadv, N. Y. Co-chairman, H. Brown, Aluminum Industries, Inc., Cincinnati.

Aluminum and Magnesium Foundry Control, by Oscar Blohm, Hills-McCanna Co., Chicago.

4 p.m. (B)—Gray Iron Shop Course (Session 1)

Presiding, George A. Timmons, Climax Molybdenum Co., Detroit. Co-Chairman, P. T. Bancroft, Republic Coal & Coke Co., Moline, Ill.

The Metallurgy of Cupola Mixes, by K. H. Priestley, Eaton Mfg. Co., Vassar, Mich.

8 p.m. (A)—Sand Shop Course (Session 1)

Presiding, F. S. Brewster, Dow Chemical Co., Bay City, Mich.

Magnesium Molding Sands, by Oscar Blohm, Hills-McCanna Co., Chicago.

8 p.m. (B)—Joint Meeting, Plant Equipment and Hygiene

Presiding, James Thomson, Continental Foundry & Machine Co., East Chicago, Ind.

Co-Chairman, W. O. Vedder, Pangborn Corp., Hagerstown, Md.

Exhaust Hoods and Piping Systems, by E. A. Carsey, Kirk & Blum Mfg. Co., Cincinnati.

Dust Collection and Disposal—

Centrifugal Collectors, by H. C. Dohrmann, Buell Engineering Co., New York.

Cloth Collectors, by G. A. Boesger, W. W. Sly Mfg. Co., Cleveland.

Web Collectors, by A. S. Lundy, Claude B. Schneible Co., Detroit.

Fans and Exhausters, by Phillip Cohen, B. F. Sturtevant Co., Cleveland.

Maintenance, by K. M. Smith, Caterpillar Tractor Co., Peoria, Ill.

8 p.m. (C)—Aluminum and Magnesium

Presiding, Leslie Brown, Magnesium Fabricators Division, Bohn Aluminum & Brass Corp., Adrian, Mich., Co-Chairman, G. G. Glider, Ebaloy Foundries Inc., Rockford, Ill.

Interrelation of Various Major Factors Determining the Amount of Microporosity in Magnesium Alloy Castings, by L. W. Eastwood and J. A. Davis, Battelle Memorial Institute, Columbus, O.

The Effect of Mold Materials and Practices on the Quality of Magnesium Alloy Castings, by M. V. Chamberlin and J. G. Mezoff, Dow Chemical Co., Midland, Mich.

Centrifugal Casting of a Magnesium Part, by F. P. Strieter and R. J. Maenner, Dow Chemical Co., Midland, Mich.

Tuesday, May 7

10 a.m. (A)—Malleable Foundry Practice

Presiding, A. M. Fulton, Northern Malleable Iron Co., St. Paul, Minn., Co-Chairman, C. F. Joseph, Saginaw Malleable Division, General Motors Corp., Saginaw, Mich.

Chemical Composition of Malleable Iron, by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

Cores for Automotive Malleable Iron Castings, by W. G. Ferrell, Auto Specialties Mfg. Co., St. Joseph, Mich.

Heat Treating Furnaces in Foundry Work, by Victor Paschkis, Columbia University, New York.

10 a.m. (B)—Aluminum and Magnesium

Presiding, Walter Bonsack, National Smelting Co., Cleveland. Co-Chairman, L. W. Eastwood, Battelle Memorial Institute, Columbus, O.

Heat Treatment of Aluminum Alloy Castings, by Walter E. Sicha and H. J. Rowe, Aluminum Company of America, Pittsburgh.

The Effect of Certain Elements on Some Properties of an Aluminum Sand Casting Alloy, by R. A. Quadt, American Smelting & Refining Co., Barber, N. J.

Characteristics of Aluminum Casting Alloy 3 Per Cent Silicon—5 Per Cent Copper, by O. Tichy, National Smelting Co., Cleveland.

10 a.m. (C)—Inspection of Castings

Presiding, Harold W. Warner, Allis-Chalmers Mfg. Co., Milwaukee. Co-Chairman, E. G. Leverenz, American Steel Foundries, East Chicago, Ind.

Duties and Functions of the Inspection Department, as Seen by Management, by M. D. Johnson, Puralator Products Inc., Newark, N. J.

Inspection—the Backbone of Quality Control, by W. H. Gunselman, Samuel Greenfield Co. Inc., Buffalo.

Non-Destructive Inspection of Castings, by C. L. Frear and R. E. Lyons, Bureau of Ships, U. S. Navy, Washington.

12 m. (A)—Luncheon—Engineering School Alumni Groups

Presiding, Fred G. Sefing, International Nickel Co., New York.

12 m. (B)—Canadian Members Luncheon

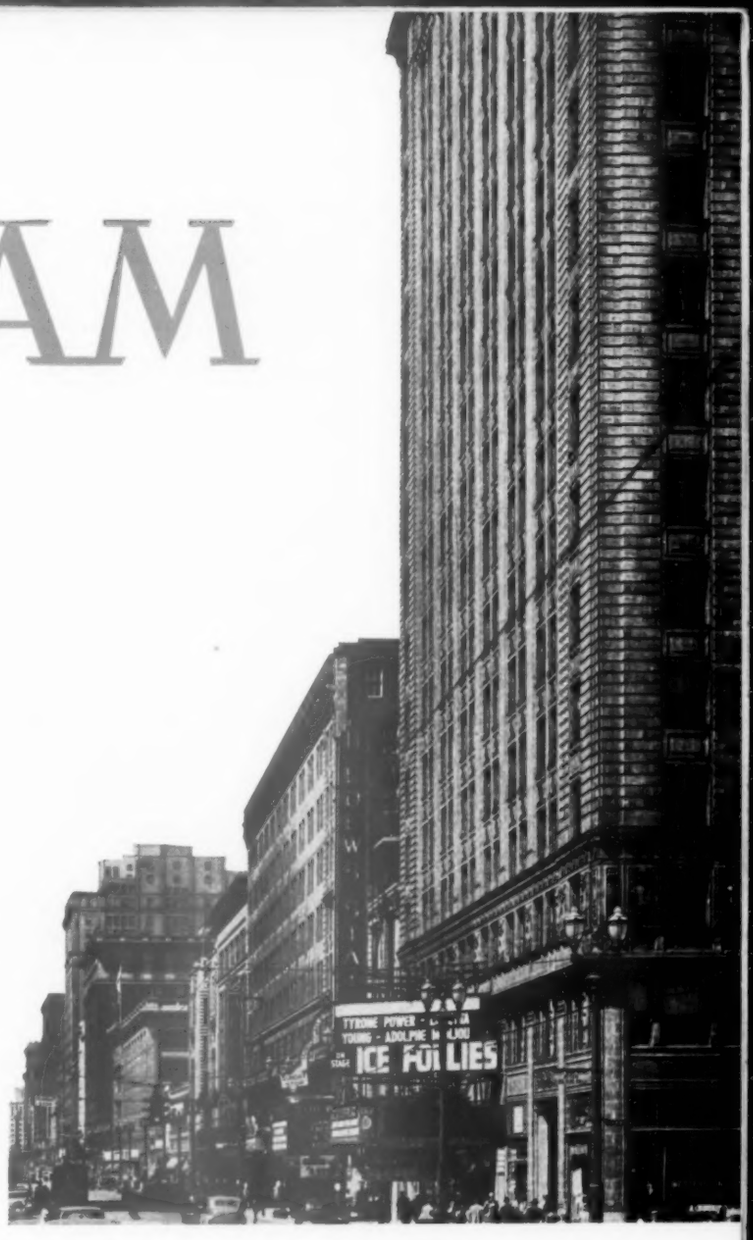
Presiding, Joseph Sully, Sully Brass Foundry Ltd., Toronto.

1-10 p.m.—Northeastern Ohio Day

2 p.m. (A)—Inspection of Castings

Presiding, E. F. Platt, Sperry Gyroscope Co., Brooklyn, N. Y. Co-Chairman, W. H. Gunselman, Samuel Greenfield Co. Inc., Buffalo.

PROGRAM



Panel Discussion: *Suppliers' and Buyers' Viewpoint of Inspection in the Foundry.* Leaders—C. H. Thomas, Chicago & Northwestern R.R., Chicago; Walter J. Klayer, Aluminum Industries, Cincinnati; John Amoroso, Sterling Engine Co., Buffalo, N. Y.; G. Dewald, Ampco Metals Inc., Milwaukee; H. Wallace, American Steel Foundries, Verona, Pa.

2 p.m. (B)—Refractories

Presiding, C. E. Bales, Ironton Fire Brick Co., Ironton, O. Co-Chairman, C. S. Reed, Chicago Retort & Fire Brick Co., Chicago.

Suggested Cupola Refractory Standardization, by R. P. Stevens, Chicago Retort & Fire Brick Co., Chicago.

Foundry Refractories—Their Properties and Application, by C. A. Brashares, Harbison-Walker Refractories Co., Pittsburgh.

Refractories in Nonferrous Practice, by H. R. Kohl, General Electric Co., Erie, Pa.

The Use of Rammed Refractories in Electric Steel Foundries, by R. H. Zoller, Zoller Castings Co., Bettsville, O.

2 p.m. (C)—Malleable Foundry Practice

Presiding, R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis., Co-Chairman, D. I. Dobson, General Malleable Corp., Waukesha, Wis.

Malleable Foundry Coremaking Practice for Pipe Fittings and Small Castings, by D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

Core Sand Practice and Control in a Large Mechanical Malleable Foundry, by Joseph J. Clark, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich.

4 p.m. (A)—Aluminum and Magnesium

Presiding, W. E. Martin, National Smelting Co., Cleveland. Co-Chairman, A. W. Stolzenburg, Aluminum Co. of America, Detroit.

Committee Report—*Unsoundness in Cast Light Alloys,* by L. W. Eastwood, Battelle Memorial Institute, Columbus, O., AFA Committee on Shrinkage and Porosity.

Report of Committee on Dimensional Stability of Aluminum Castings, by Hiram Brown, Aluminum Industries Inc., Cincinnati.

The Relation of Design and Metallurgical Factors to Serviceability of Magnesium Castings, by G. H. Found, Dow Chemical Co., Bay City, Mich.

4 p.m. (B)—Gray Iron Shop Course (Session 2)

Presiding, W. A. Hambley, Allis-Chalmers Mfg. Co., Milwaukee. Co-Chairman—George W. Anselman, Goebig Mineral Supply Co., Chicago.

Casting Defects Attributable to Metal, by AFA Casting Defects Committee.

4 p.m. (C)—Lecture Course (Session 2)

Presiding, W. B. McFerrin, Electro Metallurgical Co., Detroit. Co-Chairman, W. D. McMillan, International Harvester Co., Chicago.

Malleable Foundry Control, by C. F. Joseph, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich.

7 p.m.—Chapter Officers and Directors Dinner

Presiding, S. V. Wood, Minneapolis Electric Steel Castings Co., Minneapolis.

8 p.m. (A)—Refractories

Presiding, C. E. Bales, Ironton Fire Brick Co., Ironton, O. Co-Chairman, C. S. Reed, Chicago Retort & Fire Brick Co., Chicago.

The Lining and Patching of Cupolas, by E. J. Lally Jr., Forest City Foundries Co., Cleveland.

Information Please on foundry refractories. Moderator, C. S. Reed, Chicago Retort & Fire Brick Co., Chicago. Panel Leaders: R. H. Stone, Vesuvius Crucible Co., Swissvale, Pa.; J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.; E. J. Carmody, Chas. C. Kawin Co., Chicago; A. S. Klopf, Lester B. Knight & Associates, Chicago.

8 p.m. (B)—Sand Shop Course (Session 2)

Presiding, D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

Malleable Molding Sand Control.

Discussion Leaders—E. C. Zirzow, National Malleable & Steel Casting Co., Cleveland, L. Richard Spann, Eastern Malleable Iron Co., Naugatuck, Conn.

Wednesday, May 8

10 a.m. (A)—Malleable Foundry Practice

Presiding, W. D. McMillan, International Harvester Co., Chicago. Co-Chairman, D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.

Core Practice in an Agricultural Malleable Foundry, by Eric Welander, Union Malleable Iron Works, Moline, Ill.

Malleable Coremaking Practice, by E. C. Zirzow, National Malleable & Steel Castings Co., Cleveland.

10 a.m. (B)—Brass and Bronze

Presiding, D. Frank O'Connor, American Saw Mill Machinery Co., Hackettstown, N. J. Co-Chairman, Herman Smith, Federated Metals Div. American Smelting & Refining Co., Pittsburgh.

Observations on Gas Elimination in Nonferrous Alloy Castings, by George Dalbey, U. S. Navy Yard, Mare Island, Calif.

Correct Combustion for Crucible Furnace Melting, by A. C. Schmid, Jos. Dixon Crucible Co., Jersey City, N. J.

Conditions of Flow in Bronze Castings, by Lt. J. T. Robertson and R. G. Hardy, Naval Research Laboratory, Washington.

10 a.m. (C)—Sand Research

Presiding, H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass. Co-Chairman, J. A. Rassenfoss, American Steel Foundries, Indiana Harbor, Ind.

Sixth Annual Report of Committee on Physical Properties of Foundry Sands at Elevated Temperatures, by D. C. Williams, AFA Research Fellow, Cornell University, Ithaca, N. Y.

Heat Absorption of Sand, by H. W. Dietert and Robert L. Doelman, Harry W. Dietert Co., Detroit.

A Contribution to the Theory of Binders of Molding Sand, by L. Jenicek, Prague, Czechoslovakia.

10 a.m. (D)—Engineering Properties of Gray Iron Symposium

Presiding, R. G. McElwee, Vanadium Corp. of America, Detroit. Co-Chairman, W. E. Mahin, Illinois Institute of Technology, Chicago.

The Engineering Properties of Gray Iron, by W. E. Mahin.

12 m. (A)—Brass and Bronze Roundtable Luncheon

Presiding, B. A. Miller, Baldwin Locomotive Works, Cramp Brass & Iron Foundries Division, Philadelphia. Co-Chairman, C. Louis Lane, Florence Pipe Foundry & Machine Co., Florence, N. J.

Synthetic vs. Natural Sands, by M. T. Ganzauge, General Railway Signal Co., Rochester, N. Y.

Molding Sands for Brass and Bronze, by L. B. Osborne, Hougland & Hardy Inc., Evansville, Ind.

Effect of Section Size and Chills on Properties of Sand-Cast Bronzes, by W. B. George and A. H. Hesse, R. Lavin & Sons Inc., Chicago.

12 m. (B)—Malleable Roundtable Luncheon

Presiding, J. H. Lansing, Malleable Founders' Society, Cleveland. Co-Chairmen, A. M. Fulton, Northern Malleable Iron Co., St. Paul; K. H. Hamblin, Columbia Malleable Castings Corp., Columbia, Pa.

Atmosphere Indicators in Melting.
Single and Double Burner Use in Melting.
Use of Large End Test Bars.
Sulphur-Manganese Ratios and the Effect on Other Elements.

2 p.m. (A)—Sand Research

Presiding, Bradley H. Booth, Carpenter Bros. Inc., Milwaukee. Co-Chairman, R. E. Morey, Naval Research Laboratory, Washington.

The AFA Clay and Fineness Determinations Can Be Quantitative, by D. C. Williams, AFA Research Fellow, Cornell University, Ithaca, N. Y.

The Fineness Tests of Molding Sands, by A. I. Krynitsky and Margaret Price, Bureau of Standards, Washington.

2 p.m. (B)—Steel

Presiding, H. H. Blosjo, Minneapolis Electric Steel Castings Co., Minneapolis. Co-Chairman, Charles Locke, West Michigan Steel Castings Co., Muskegon, Mich.

Bore Cracks in Cast Steel Valves and Fittings, by H. F. Bishop, Naval Research Laboratory, Washington and H. F. Taylor, Massachusetts Institute of Technology, Cambridge, Mass.

Homogenization Heat Treatment of Cast Steel, by P. C. Rosenthal and J. G. Kura, Battelle Memorial Institute, Columbus, O.

Thermal Relief of Stresses in Steel Castings and Weldments, by C. R. Jelm and S. A. Herres, Watertown Arsenal, Watertown, Mass.

Committee Report on Heat Treatment of Steel Castings, by E. R. Young, Climax Molybdenum Co., Chicago.

2 p.m. (C)—Engineering Properties of Gray Iron Symposium

Presiding, R. G. McElwee, Vanadium Corp. of America, Detroit. Co-Chairman, W. E. Mahin, Illinois Institute of Technology, Chicago.

The Ductility and Elasticity of White and Gray Irons, by R. A. Flinn and H. J. Chapin, American Brake Shoe Co., Mahwah, N. J.

Gray Cast Iron Tensile Strength, Brinell Hardness and Composition Relationships, by T. E. Barlow and C. H. Lorig, Battelle Memorial Institute, Columbus, O.

Effect of Carbon Equivalent and Section Size on Physical Properties of Gray Iron, by K. Geist, Allis-Chalmers Mfg. Co., Milwaukee.

Structural Control for Wear Resistance, by F. G. Sefing, International Nickel Co., New York.

Practical Considerations Affecting the Section Sensitivity of Gray Iron When Applied to Actual Casting, by H. C. Winte, Worthington Pump & Machinery Corp., Buffalo.

4 p.m.—Lecture Course (Session 3)

Presiding, H. M. St. John, Crane Co., Chicago. Co-Chairman, C. O. Thieme, H. Kramer & Co., Chicago.

Brass and Bronze Foundry Control, by D. Frank O'Connor, American Saw Mill Machinery Co., Hackettstown, N. J.

6 p.m.—Foundry Instructors' Dinner

Presiding, P. E. Kyle, Massachusetts Institute of Technology, Cambridge, Mass.

8 p.m. (A)—Foreman Training

Presiding, F. E. Wartgow, American Foundrymen's Association, Chicago.

Engineer of Human Relations, by Steven G. Garry, Caterpillar Tractor Co., Peoria, Ill.

8 p.m. (B)—Engineering Student Training

Presiding, G. J. Barker, University of Wisconsin, Madison, Wis. Co-Chairman, C. J. Freund, University of Detroit, Detroit.

Panel Discussion: *College Graduates vs. Employers.*

8 p.m. (C)—Sand Shop Course (Session 3)

Presiding, E. E. Woodliff, Foundry Sand Service Engineering Co., Detroit.

Brass and Bronze Sand Control. Discussion Leader, W. H. Ball Jr., Magnus Brass Division, National Lead Co., Cincinnati.

8 p.m. (D)—Gray Iron Shop Course (Session 3)

Presiding, T. E. Barlow, Battelle Memorial Institute, Columbus, O. Co-Chairman, W. B. McFerrin, Electro Metallurgical Co., Detroit.

Casting Defects Attributable to Metal, by AFA Casting Defects Committee.

Thursday, May 9

8:30 a.m. (A)—Cost Committee Breakfast Meeting

Presiding, R. L. Lee, Grede Foundries Inc., Milwaukee.

Small Shop Cost System. Discussion Leaders—Foundry Cost Committee members.

8:30 a.m. (B)—Gray Iron Shop Course (Session 4)

Presiding, E. J. Burke, Hanna Furnace Corp., Detroit. Co-Chairman, P. T. Bancroft, Republic Coal & Coke Co., Moline, Ill.

The Metallurgy of Carbon Control in the Cupola, by Ralph A. Clark, Electro Metallurgical Co., Chicago.

9:30 a.m.—Annual Business Meeting

Presiding, F. J. Walls, president, American Foundrymen's Association. Vice-Chairman, S. V. Wood, vice-president, American Foundrymen's Association.

President's Annual Address

Report on Election of Officers and Directors

AFA Foundation Lecture, *Test Bars for 85 Copper-5 Tin-5 Lead-5 Zinc Alloy-Design and Some Factors Affecting Their Properties*, by G. H. Clamer, Ajax Metal Co., Philadelphia.

12 m. (A)—Steel Round Table Luncheon

Presiding, T. D. West, West Steel Casting, Cleveland. Co-Chairman, E. C. Troy, Dodge Steel Co., Philadelphia.

General Discussion on Steel Foundry Practice.

2 p.m. (A)—Brass and Bronze

Presiding, G. K. Dreher, Ampco Metal Inc., Milwaukee. Co-Chairman, A. K. Higgins, Allis-Chalmers Mfg. Co., Milwaukee.

Use of Insulating Pads and Riser Sleeves for Producing Sound Bronze Castings, by H. F. Taylor and W. C. Wick, Naval Research Laboratory, Washington.

Knock-off Risers for Nonferrous Castings, by Stanley W. Brinson and J. A. Duma, Norfolk Navy Yard, Portsmouth, Va.

Sealing Bronze Pressure Castings Through Heat Treatment, by F. L. Riddell, Naval Research Laboratory, Washington.

2 p.m. (B)—Patternmaking

Presiding, Frank C. Cech, Cleveland Trade School, Cleveland. Co-Chairman, V. J. Sedlon, Master Pattern Co., Cleveland.

General Discussion on Patternmaking.

Use of Wood Models in Planning and Design, by G. W. Schuller, Caterpillar Tractor Co., Peoria, Ill.

Patterns as the Production Foundry Sees Them, by Guy Pealer, Elmira Foundry Co. Inc., Elmira, N. Y.

2 p.m. (C)—Gray Iron

Presiding, T. E. Eagan, Cooper-Bessemer Corp., Grove City, Pa. Co-Chairman, R. J. Allen, Worthington Pump & Machinery Corp., Harrison, N. J.

Microstructure Related to Properties of Cast Iron, by W. E. Mahin, Armour Research Foundation, Illinois Institute of Technology, Chicago and H. W. Lownie Jr., Battelle Memorial Institute, Columbus, O.

Cupola Operation and Control, by W. W. Levi, Lynchburg Foundry Co., Radford, Va.

Technical Organization of the French Foundry, by A. Le Thomas, president French Technical Committee of Foundry Industries, French Exchange Paper.

2 p.m. (D)—Job Evaluation and Time Study

Presiding, Robert J. Fisher, the Falk Corp., Milwaukee. Co-Chairman, F. E. Wartgow, American Foundrymen's Association, Chicago.

What Management Should Know About Time Study, by Phil Carroll Jr., Crestwood, N. J.

4 p.m. (A)—Foundry Costs

Presiding, R. L. Lee, Grede Foundries Inc., Milwaukee. Co-Chairman, L. M. Nesselbush, Falcon Bronze Co., Youngstown, O.

Current Foundry Problems and Fundamentals of Cost for Small Foundries.

Meeting Foundry Competition With a Sand Cast Program, by A. E. Grover, Cost Consultant, Cleveland Heights, O.

4 p.m. (B)—Apprentice Training

Presiding, F. C. Cech, Cleveland Trade School, Cleveland. W. J. Hebard, Continental Foundry & Machine Co., East Chicago, Ind.

Panel Discussion: *Standard Apprentice Training; Accelerated Training Program; Upgrading Systems; Veteran Training; General Summary.*

Panel Discussion:

Standard Apprentice Training, by Carl F. Haertel, Falk Corp., Milwaukee.

Accelerated Training Program, by W. J. Hebard, Continental Foundry & Machine Co., East Chicago, Ind.

Upgrading Systems, by M. J. Gregory, Peoria, Ill.

Veteran Training, by W. M. Owen, Caterpillar Tractor Co., Peoria, Ill.

General Summary, by C. J. Freund, University of Detroit, Detroit.

4 p.m. (C)—Lecture Course (Session 4)

Presiding, John Howe Hall, Swarthmore, Pa. Co-Chairman, C. E. Sims, Battelle Memorial Institute, Columbus, O.

Steel Foundry Control, by G. A. Lillieqvist, American Steel Foundries, East Chicago, Ind.

5 p.m.—Reception for Foreign Visitors

6:45 p.m.—Apprentice Training Dinner

Presiding, C. W. Wade, Caterpillar Tractor Co., Peoria, Ill.

A Means to Produce Skilled and Leadership Personnel, by J. E. Goss, Brown & Sharpe Mfg. Co., Providence, R. I.

7 p.m.—A.F.A. Alumni Dinner

Presiding, Ralph J. Teetor, Cadillac Malleable Iron Co., Cadillac, Mich.

8 p.m. (A)—Sand Shop Course (Session 4)

Presiding, E. E. Woodliff, Foundry Sand Service Eng. Co., Detroit.

Gray Iron Sand Control. Discussion Leaders, H. C. Winte, Worthington Pump & Machinery Corp., Buffalo, T. W. Curry, Lynchburg Foundry Co., Lynchburg, Va.

Factors To Consider When Purchasing Core Sand, by H. Louette, Warden King Ltd., Montreal, Que.

8 p.m. (B)—Job Evaluation and Time Study

Presiding, Robert J. Fisher, the Falk Corp., Milwaukee. Co-Chairman, F. E. Wartgow, American Foundrymen's Association, Chicago.

Round Table Discussion of Time Study Practices, Discussion Leaders, Phil Carroll Jr., Maplewood, N. J., J. C. Lewis, Associated Engineers, Inc., Fort Wayne, Ind.

8 p.m. (C)—Apprentice Training

Presiding, C. W. Wade, Caterpillar Tractor Co., Peoria, Ill. Co-Chairman, John Grennan, University of Michigan, Ann Arbor, Mich.

Passing On the Know-How, by R. L. Lee, General Motors Corp., Detroit.

Friday, May 10

9:30 a.m.—Sand Shop Course (Session 5)

Presiding, R. H. Jacoby, Key Co., E. St. Louis, Ill.

Steel Foundry Sand Control. Discussion Leader, E. E. Woodliff, Foundry Sand Service Engineering Co., Detroit.

10 a.m. (A)—Gray Iron

Presiding, H. Bornstein, Deere & Co., Moline, Ill. Co-Chairman, V. A. Crosby, Climax Molybdenum Co., Detroit.

Effect of Heat Treatment on the Endurance Limit of Alloyed Gray Cast Iron, by T. E. Eagan, Cooper-Bessemer Corp., Grove City, Pa.

Engineering Properties of Heat Treated Cast Irons, by J. S. Vanick, International Nickel Co., New York.

Discussion of Charts, *Cupola Operations Handbook*, by R. G. McElwee, Vanadium Corp. of America, Detroit.

Theories of Gray Cast Iron Inoculation, by H. W. Lownie Jr., Battelle Memorial Institute, Columbus, O.

10 a.m. (B)—Steel

Presiding, C. H. Lorig, Battelle Memorial Institute, Columbus, Ohio. Co-chairman, J. A. Rassenfoss, American Steel Foundries, East Chicago, Ind.

Preliminary Investigation of Methods for Control of Hardenability at the Furnace, by G. Vennerholm, Ford Motor Co., Dearborn, Mich.

Methods of Quality Control in the Foundry, by J. W. Juppenlatz, Lebanon Steel Foundry, Lebanon, Pa.

Committee Report, *Production of Steel for Castings*, by C. E. Sims, Battelle Memorial Institute, Columbus, O.

Conventional vs. Washburn Risers for Steel Castings, by W. E. Jones, American Steel Foundries, Bettendorf, Ia.

2 p.m. (A)—Steel

Presiding, J. W. Juppenlatz, Lebanon Steel Foundry, Lebanon, Pa. Co-Chairman, J. B. Caine, Sawbrook Steel Castings Co., Cincinnati.

Low Temperature Properties of Certain Steels, by C. E. Sims and F. W. Boulger, Battelle Memorial Institute, Columbus, O.

Production of Grand Slam Bomb Castings, by Basil Gray, English Steel Corp., Sheffield, England. Institute of British Foundrymen Exchange Paper.

Susceptibility of Steel to Hot Tear Formation in Casting, by N. B. Gelperin, Moscow Dev., State Institute, "Giprotjagmashe," Moscow.

Technological Principles of Casting Design, by Prof. Victor M. Shestopal, Stalin Machine Tool Institute, Moscow.

Committee Report on Non-Destructive Testing, by C. W. Briggs, Steel Founders' Society of America, Cleveland.

2 p.m. (B)—Gray Iron Welding

Presiding, E. C. Jeter, Ford Motor Co., Dearborn, Mich. Co-Chairman, John Crowe, Air Reduction Sales Co., New York.

Metallurgical Aspects of Repair Welding of Gray Iron, by J. A. Blastic, Detroit Diesel Division, J. A. Griffin, Pontiac Motor Division, and J. M. Diebold, General Motors Truck & Coach Division, General Motors Corp., Detroit.

Physical Aspects of Welding Gray Iron Castings, by W. Pfander, Ford Motor Co., Dearborn, Mich.

Welding Heavy Gray Iron Sections, by L. J. Larsen, Allis-Chalmers Mfg. Co., Milwaukee.

2 p.m. (C)—Brass and Bronze

Presiding, G. P. Halliwell, H. Kramer & Co., Chicago. Co-Chairman, A. H. Hesse, R. Lavin & Sons Inc., Chicago.

Distribution of Mechanical Properties in Sand Cast Bronzes, by R. H. Brouk, R. G. Hardy, and B. M. Loring, Naval Research Laboratory, Washington.

Committee Report on Manganese Bronze, by G. K. Dreher, Ampco Metal Inc., Milwaukee.

Manganese Bronze, by H. E. Arblaster, Institute of Australian Foundrymen Exchange Paper.

4 p.m.—Lecture Course (Session 5)

Presiding, W. H. Rother, Buffalo Foundry & Machine Co., Buffalo, N. Y. Co-Chairman, J. S. Vanick, International Nickel Co., New York.

Gray Iron Foundry Control, Discussion Leader W. A. Hambley, Allis-Chalmers Mfg. Co., Milwaukee.

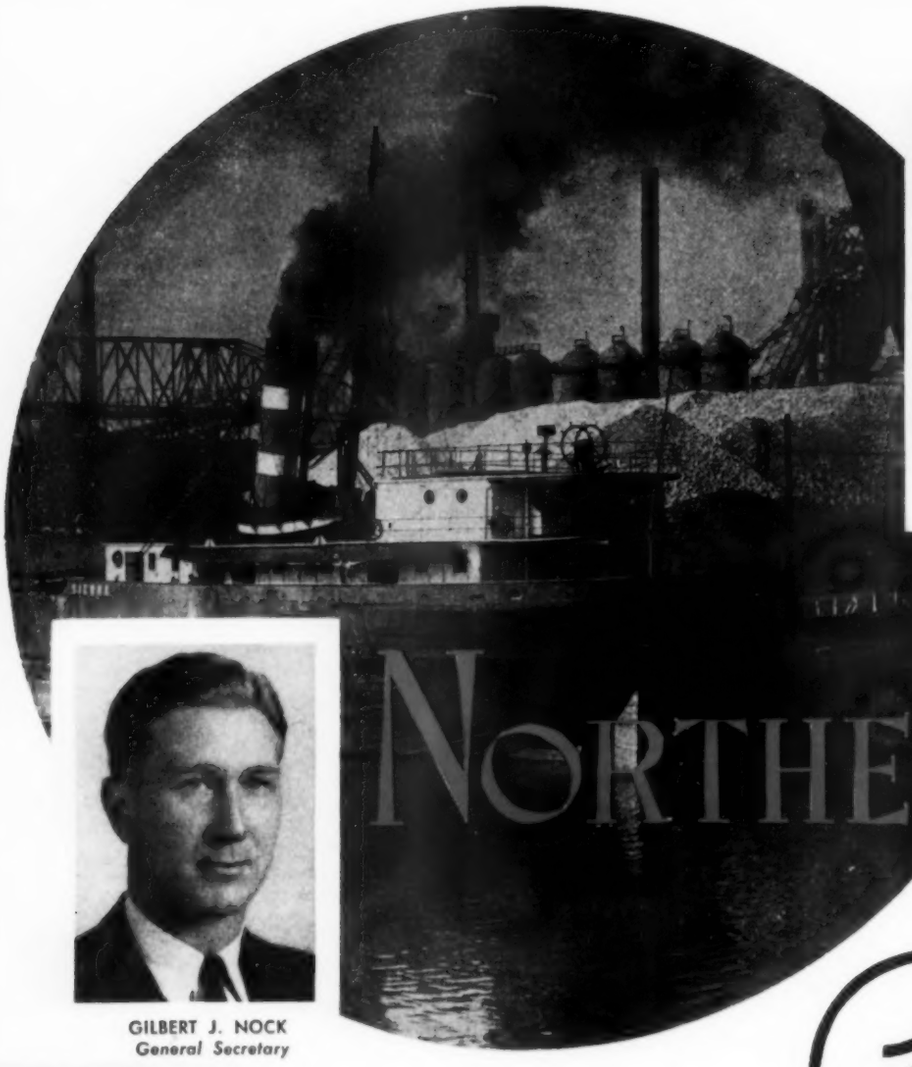
4 p.m.—Exhibits Officially Close

7 p.m.—Annual Dinner

Presiding, F. J. Walls, president, American Foundrymen's Association. Vice-Chairman, S. V. Wood, vice president, American Foundrymen's Association.

Presentation of A.F.A. Gold Medal Awards and Honorary Life Memberships.

Speaker, Brig.-Gen. Donald Armstrong, Commandant, The Army Industrial College, Washington.



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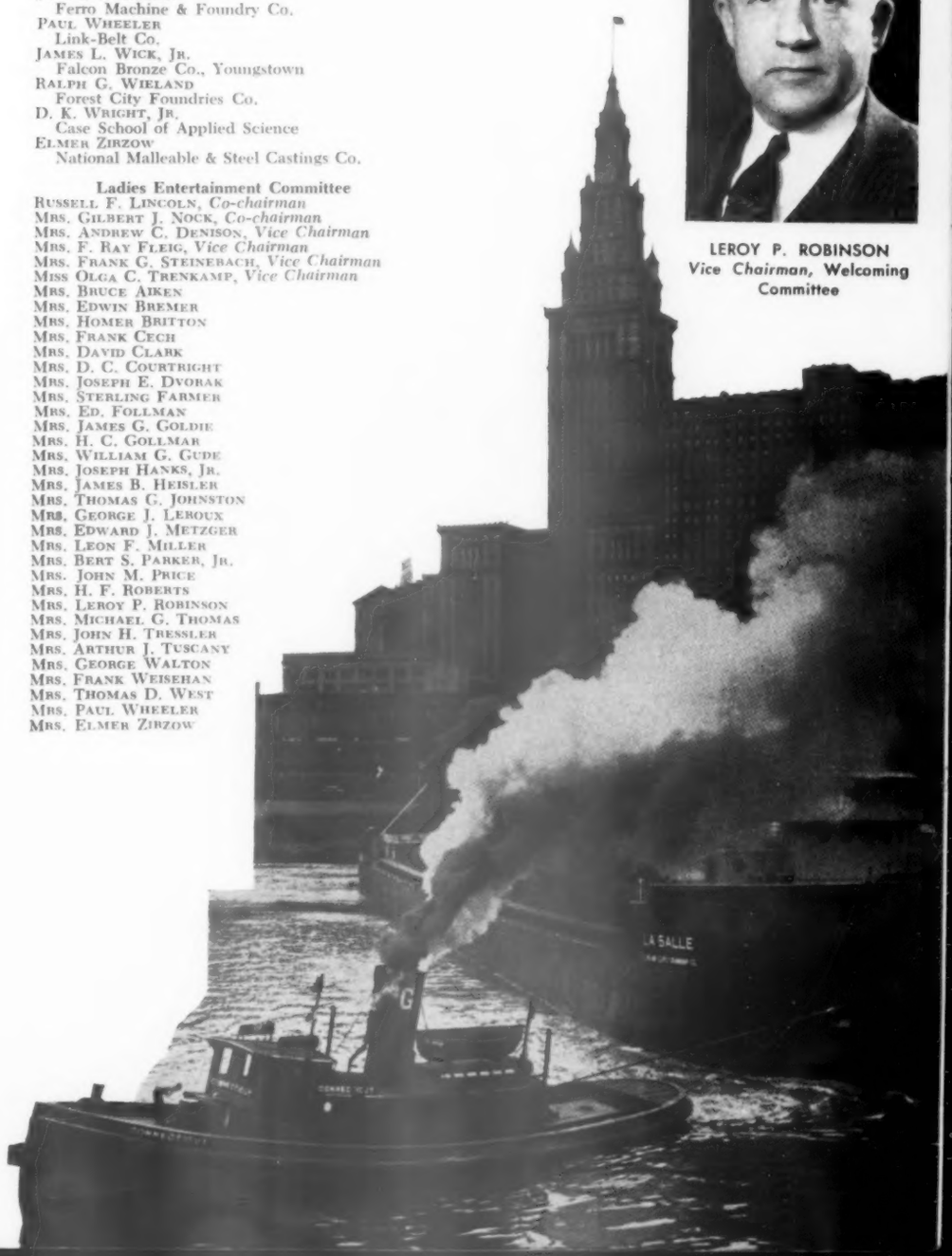

FOUNDRY SHOW *to*

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(Photos pp. 135, 138, 139, 140, 143, 144 by Perry Cragg, *Cleveland News*).

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(Corrected to April 10)

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Adams Co., Dubuque, Iowa
Air Reduction Sales Co., New York
Ajax Engineering Co., Trenton, N. J.
Ajax Flexible Coupling Co., Westfield, N. Y.
Ajax Metal Co., Philadelphia
Allis-Chalmers Mfg. Co., Milwaukee
Alloy Metal Abrasive Co., Ann Arbor, Mich.
Aluminum Refiners Div. of Bohn Aluminum, Detroit
American Air Filter Co. Inc., Louisville
American Chain Ladder Co. Inc., New York
American Crucible Co., Shelton, Conn.
American Foundry Equipment Co., Mishawaka, Ind.
American Gum Products Co., New York
American Metal Market, New York
American Society for Metals, Cleveland
American Steel Abrasives Co., Galion, O.
Apex Smelting Co., Chicago
Arcade Mfg. Co., Division Rockwell Mfg. Co., Freeport, Ill.
Asbury Graphite Mills Inc., Asbury, N. J.
Automatic Transportation Co., Chicago
Ayers Mineral Co., Zanesville, O.

Baker Industrial Truck Division, Baker-Raulang Co., Cleveland
Barrett-Cravens Co., Chicago
C. O. Bartlett & Snow Co., Cleveland
Beardsley & Piper Co., Chicago
Black, Sivalls & Bryson Inc., Kansas City, Mo.
Blaw-Knox Co., Pittsburgh
Bloomsbury Graphite Co., Bloomsbury, N. J.
Bradley Washfountain Co., Milwaukee
Brickseal Refractory Co., Hoboken, N. J.
Brush Beryllium Co., Cleveland
Buckeye Products Co., Cincinnati
Buckeye Tool Corp., Dayton, O.
Buffalo Forge Co., Buffalo

Caldwell Co., Rockford, Ill.
Campbell-Hausfeld Co., Harrison, O.
Canadian Radium & Uranium Corp., New York
Carborundum Co., Niagara Falls, N. Y.
Carl-Mayer Corp., Cleveland
Edwin S. Carman Inc., Cleveland
Centrifugal Casting Machine Co., Tulsa, Okla.
Certified Core Oil Division, Cicero, Ill.
Chain Belt Co., Milwaukee
Champion Foundry & Machine Co., Chicago
Chicago Pneumatic Tool Co., New York
Chicago Retort & Fire Brick Co., Chicago
Chisholm-Moore Hoist Co., Tonawanda, N. Y.
Clark Tructractor Co., Battle Creek, Mich.
Clearfield Machine Co., Clearfield, Pa.
Cleveland Flux Co., Cleveland
Cleveland Pneumatic Tool Co., Cleveland
Cleveland Vibrator Co., Cleveland
Cleveland Wire Spring Co., Cleveland
Climax Molybdenum Co. Inc., New York
Coaltoter Conveyor Co., Chicago
L. A. Cohn & Brothers Inc., Cicero, Ill.
Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Combined Supply & Equipment Co. Inc., Buffalo
Conover Engineering Co., Cleveland
Controlamix Co., Milwaukee
Corn Products Sales Co., New York
Crescent Machine Co., Latonia, O.
Frank L. Crobaugh Co., Cleveland

Daily Metal Reporter, New York
Davenport Machine & Foundry Co., Davenport, Iowa
Dayton Oil Co., Dayton, O.
Delhi Foundry Sand Co., Cincinnati
Delta Mfg. Co., Milwaukee
Delta Oil Products Co., Milwaukee

to stress progress
d materials

UTILIZING for the first time all six exhibit areas of Cleveland's Public Auditorium, the 1946 Foundry Show to be held in connection with the Golden Jubilee Convention of the American Foundrymen's Association will be the largest display of foundry equipment and supplies in the organization's history.

More than 260 companies serving the foundry industry will be represented with exhibits featuring the latest developments in machinery and materials employed in the production of castings.

Exhibit hours are as follows: Opening hours, Monday, May 6, 9:30 a.m.; Tuesday, May 7, through Friday, May 10, 9 a.m. Closing hour, 5:30 p.m. daily, except Tuesday, May 7, Northeastern Ohio Day, when closing will be 10 p.m., and Friday, May 10, when the show will officially close at 4 p.m.

William Demmler & Bros., Kewanee, Ill.
Despatch Oven Co., Minneapolis
Harry W. Dietert Co., Detroit
Joseph Dixon Crucible Co., Jersey City, N. J.
Do-All Co., Minneapolis
Dougherty Lumber Co., Cleveland
Duquesne Smelting Corp., Pittsburgh

Eastern Clay Products Inc., Eifort, O.
Eastman Kodak Co., Rochester, N. Y.
Electric Controller & Mfg. Co., Cleveland
Electro Metallurgical Co., New York
Electro Refractories & Alloys Co., Buffalo
Elesco Smelting Corp., Chicago
Elwell-Parker Electric Co., Cleveland
Employers Mutual Liability Insurance Co. of Wisconsin, Milwaukee
Eutectic Welding & Alloys Corp., New York

Fabreeka Products Co., Boston
Federal Foundry Supply Co., Cleveland
Federal Metal Co., Cleveland
Federated Metals Division, American Smelting & Refining Co., New York
Fellows Corp., Milwaukee
Fen Machine Co., Cleveland
Fisher Furnace Co., Chicago
Forker Corp., Cleveland
Foundry Equipment Co., Cleveland
Foundry Equipment Manufacturers Association
The Foundry, Cleveland
Foxboro Co., Foxboro, Mass.
Fox Grinders Inc., Pittsburgh
Freeman Supply Co., Toledo, O.
Fremont Flask Co., Fremont, O.

Russell R. Gannon Co., Cincinnati
General Electric X-Ray Corp., Chicago
General Grinding Wheel Corp., Philadelphia
Globe Steel Abrasive Co., Mansfield, O.
Gray Iron Founders Society, Cleveland
Great Lakes Foundry Sand Co., Detroit
Great Western Mfg. Co., Leavenworth, Kans.
Samuel Greenfield Co., Buffalo

Hardy Sand Co., Evansville, Ind.
Harnischfeger Corp., Milwaukee
Benjamin Harris & Co., Chicago Heights, Ill.
Hercules Powder Co., Wilmington, Del.
Herman Pneumatic Machine Co., Pittsburgh
Hickman, Williams & Co., Cleveland
Hill & Griffith Co., Cincinnati
Hines Flask Co., Cleveland
Hoffman Foundry Supply Co., Cleveland
Frank G. Hough Co., Libertyville, Ill.
Houghland & Hardy Inc., Evansville, Ind.
E. F. Houghton & Co., Philadelphia
Hydro-Blast Corp., Chicago

Illinois Clay Products Co., Chicago
Illinois Testing Laboratories Inc., Chicago
Independent Pneumatic Tool Co., Chicago
Induction Heating Corp., New York
Industrial Minerals Co., Lancaster, O.
Ingersoll-Rand Co., New York
International Graphite & Electrode Corp., St. Marys, Pa.
International Molding Machine Co., Chicago
International Nickel Co. Inc., New York
Interstate Smelting & Refining Co., Chicago
Iron Age, New York

Jeffery Mfg. Co., Columbus, O.
William F. Jobbins Inc., Aurora, Ill.
Johns-Manville, New York
Johnston & Jennings Co., Cleveland

Kerkling & Co., Bloomington, Ind.
Kindt-Collins Co., Cleveland
Lester B. Knight & Associates, Chicago
Kolene Corp., Detroit
H. Kramer & Co., Chicago
Kuhlman Electric Co., Bay City, Mich.

Laboratory Equipment Co., Benton Harbor, Mich.
Lauhoff Grain Co., Danville, Ill.
Lava Crucible Co., Pittsburgh
R. Lavin & Sons Inc., Chicago
Lincoln Engineering Co., St. Louis, Mo.
Link-Belt Co., Chicago
Lithaloys Corp., New York

Macleod Co., Cincinnati
Macklin Co., Jackson, Mich.
Magnesium Association, New York
Mall Tool Co., Chicago
Malleable Founders Society, Cleveland
Manhattan Rubber Mfg. Co., Passaic, N. J.
Manley Sand Co., Rockton, Ill.
Martin Engineering Co., Kewanee, Ill.
Martindale Electric Co., Cleveland
Master Tool Co. Inc., Cleveland
Mathews Conveyer Co., Ellwood City, Pa.
J. S. McCormick Co., Pittsburgh
Metallizing Co. of America, Chicago
Michigan Smelting & Refining Division, Detroit
Milwaukee Foundry Equipment Co., Milwaukee
Mine Safety Appliances Co., Pittsburgh
Miskella Infra-Red Co., Cleveland
Modern Equipment Co., Port Washington, Wis.
Molybdenum Corp. of America, Pittsburgh
Monroe Tool & Mfg. Co., Monroe, Mich.

Nassau Smelting & Refining Co., New York
National Carbon Co. Inc., New York
National Engineering Co., Chicago
Newark Pattern & Machine Co., Newark, O.
Newaygo Engineering Co., Newaygo, Mich.
New Jersey Silica Sand Co., Millville, N. J.
Niagara Falls Smelting & Refining Corp., Buffalo
Nichols Engineering & Research Corp., New York
Wm. H. Nicholls Co. Inc., Richmond Hill, N. Y.
Nock & Sons Co., Cleveland
Nock Fire Brick Co., Cleveland
Non-Ferrous Founders Society, Chicago
North American Smelting Co., Philadelphia
Norton Co., Worcester, Mass.

S. Obermayer Co., Chicago
Oiless Core Binder Co., Cleveland
Oliver Machinery Co., Grand Rapids, Mich.
Osborn Mfg. Co., Cleveland

Pangborn Corp., Hagerstown, Md.
Parsons Engineering Corp., Cleveland
Peerless Mineral Products Co., Conneaut, O.
Peninsular Grinding Wheel Co., Detroit
Penola Inc., Pittsburgh
Penton Publishing Co., Cleveland
George F. Pettinos Inc., Philadelphia
Pittsburgh Crushed Steel Co., Pittsburgh
Pittsburgh Lectromelt Furnace Corp., Pittsburgh
Pittsburgh Metals Purifying Co., Pittsburgh
P. M. S. Co., Cleveland
Powermatic Ventilator Co., Cleveland
Furity Moulding Sand Co., Dallas City, Ill.
Pyro Clay Products Co., Oak Hill, O.
Pyrometer Instrument Co., New York

Radium Chemical Co. Inc., New York
N. Ransohoff Inc., Cincinnati
Ramtite Co., Chicago
Ready Power Co., Detroit
Redford Iron & Equipment Co., Detroit
Reliable Pattern & Castings Co., Cincinnati
Republic Coal & Coke Co., Chicago
Republic Structural Iron Works, Cleveland
Robeson Process Co., New York
Robins Conveyors Inc., Passaic, N. J.
Romph Furnace Co., Dearborn, Mich.
Rotocast Foundry Equipment Co., Coldwater, Mich.
Rotor Tool Co., Cleveland
Royer Foundry & Machine Co., Kingston, Pa.

Safety Clothing & Equipment Co., Cleveland
Sand Products Corp., Cleveland
Claude B. Schneible Co., Detroit
Schramm Inc., West Chester, Pa.
F. E. Schundler & Co. Inc., Joliet, Ill.
Semet-Solvay Co., New York
Severance Tool Industries Inc., Saginaw, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Simonds Abrasive Co., Philadelphia
Simplicity Engineering Co., Durand, Mich.
W. W. Sly Mfg. Co., Cleveland
Smith Facing & Supply Co., Cleveland
Smith Oil & Refining Co., Rockford, Ill.
Werner G. Smith Co., Cleveland
Spencer Turbine Co., Hartford, Conn.
SPO Inc., Cleveland
Springfield Facing—Obermayer Newark Division, Harrison, N. J.
Standard Conveyor Co., North St. Paul, Minn.
Standard Horse Nail Corp., New Brighton, Pa.
Standard Safety Equipment Co., Chicago
Standard Sand & Machine Co., Chicago
Steelblast Abrasives Co., Cleveland
Steel Shot & Grit Co., Boston
Sterling Wheelbarrow Co., Milwaukee
Frederic B. Stevens Inc., Detroit
Stroman Furnace & Engineering Co., Chicago
Swan-Finch Oil Corp., New York
Syntron Co., Homer City, Pa.

Tabor Mfg. Co., Philadelphia
Taggart & Co., Philadelphia
Tamms Silica Co., Chicago
Thiem Products Co., Milwaukee
Toledo Scale Co., Toledo, O.

Union Carbide & Carbon Corp., New York
United Compound Co., Buffalo
United Oil Mfg. Co., Erie, Pa.
U. S. Electrical Tool Co., Cincinnati
United States Graphite Co., Saginaw, Mich.
United States Gypsum Co., Chicago
U. S. Hoffman Machinery Corp., New York
United States Reduction Co., East Chicago, Ind.

Vanadium Corp. of America, New York
Velsicol Corp., Chicago
Vesuvius Crucible Co., Pittsburgh

West Abrasives Inc., Philadelphia
Western Metal Abrasives Co., Cleveland
Western Metal Co., Chicago
Whitehead Bros. Co., New York
Whiting Corp., Harvey, Ill.
Lee Wilson Engineering Co. Inc., Cleveland

Yale & Towne Mfg. Co., Philadelphia

Zanesville Sand Co., Zanesville, O.

HYMAN BORNSTEIN

HOWARD F. TAYLOR

A.F.A HONORS FIVE *for Outstanding*

FIVE men prominent for years in the foundry industry have been selected by the Board of Awards of the American Foundrymen's Association to receive special honors during the 50th Anniversary Convention in Cleveland. Three medals and two honorary life memberships in the association will be presented at the annual dinner to be held at Hotel Statler, Friday evening, May 10.

HYMAN BORNSTEIN, director of testing and research laboratories, Deere & Co., Moline, Ill., will receive the William H. McFadden Gold Medal of the association "for his many and outstanding technological contributions to the foundry industry, particularly in the field of gray cast iron."

HOWARD F. TAYLOR, formerly of the Naval Research Laboratory, Washington, will be awarded the Peter L. Simpson Memorial Medal of the AFA "for his unfailing interest in and contributions to foundry research, and for his influence in broadening naval research in the field of cast metals."

PETER BLACKWOOD, foundry superintendent, Ford Motor Co. of Canada Ltd., Windsor, Ont., will be the recipient of the John H. Whiting Gold Medal of the AFA "for his development work in and influence on free interchange of information pertaining to centrifugal castings."

HAROLD J. ROAST, vice president, Canadian Bronze Co. Ltd., Montreal, Que., has been elected an honorary life member of the AFA "in recognition of his many and long continued contributions to the literature and co-operative enterprise of the foundry industry, both in the United States and Canada."

WILLIAM J. COANE, vice president, Ajax Metal Co., Philadelphia, has been named to honorary life membership in the AFA "because of his long and continued service to the industry, and in recognition of the fact that he is one of the organizers and attended the first convention of the American Foundrymen's Association at Philadelphia in 1896."

PETER BLACKWOOD

HAROLD J. ROAST

WILLIAM J. COANE

FOUNDRYMEN *Service to Industry*

Hyman Bornstein was born in Chicago, and was graduated from the former Armour Institute of Technology in 1911 with a B.S. degree in chemical engineering. Taking up the study of law, he was graduated from John Marshall Law School, Chicago, in 1915 with an L.L.B. degree. He held positions as chemist for the Union Pacific Railroad, Swift & Co., and the City of Chicago, before entering military service in World War I as a captain in the Ordnance Department. Following his military service he became associated with Deere & Co. A past chairman of the former Quad City Foundrymen's Association, Mr. Bornstein took an active part in organizing that group as the Quad City Chapter of the AFA, and is still an active member. A national director of the AFA in 1932-1935, he was elected national president in 1937. He has served as chairman of the association's Gray Iron Division and as chairman or member of other ferrous committees of that group, a member of the Committee on Liquid Shrinkage Investigation of Metals Advisory to the Bureau of Standards, a member of the Ferrous Metals Committee to that bureau, and chairman of the Alloy Iron Committee. He is recognized internationally as one of the nation's leading metallurgists and authority on cast iron.

Howard F. Taylor, a native of Leslie, Mich., received both B.S. and M.S. degrees from Michigan State College, East Lansing, Mich. Beginning his business career as a clerk in the Michigan state highway department, he was later connected with Michigan State College as an instructor in the foundry department and subsequently was an instructor in the metallurgy department. For a number of years Mr. Taylor has been associated with the Steel Castings Section of the Naval Research Laboratory, Washington, and is well known for his work there in fundamental and practical studies of various foundry subjects. At present he is on leave from the Naval Research Laboratory, studying for his doctor's degree at Massachusetts Institute of Technology as Research Fellow, Gray Iron Founders' Society. Mr. Taylor has long been a (*Please turn to page* 226)

Association carries on activities through work of technical committees, technical papers at conventions, exhibitions of equipment and supplies, publications and the work of 32 chapters

AFA SERVES

SOME one—not to put too fine a point upon it—once said "Of the making of books there is no end." Books have been written on every conceivable subject, and yet one may search vainly through the avalanche pouring from the presses for a book on the American Foundrymen's Association. Material for a good, fat book is available in the pages of THE FOUNDRY and the *Transactions* of the association. It is reasonable to assume that such a book would appeal to the majority of the members. The following brief reference to the early days of the association is based upon editorials and other articles which appeared at various times in THE FOUNDRY.

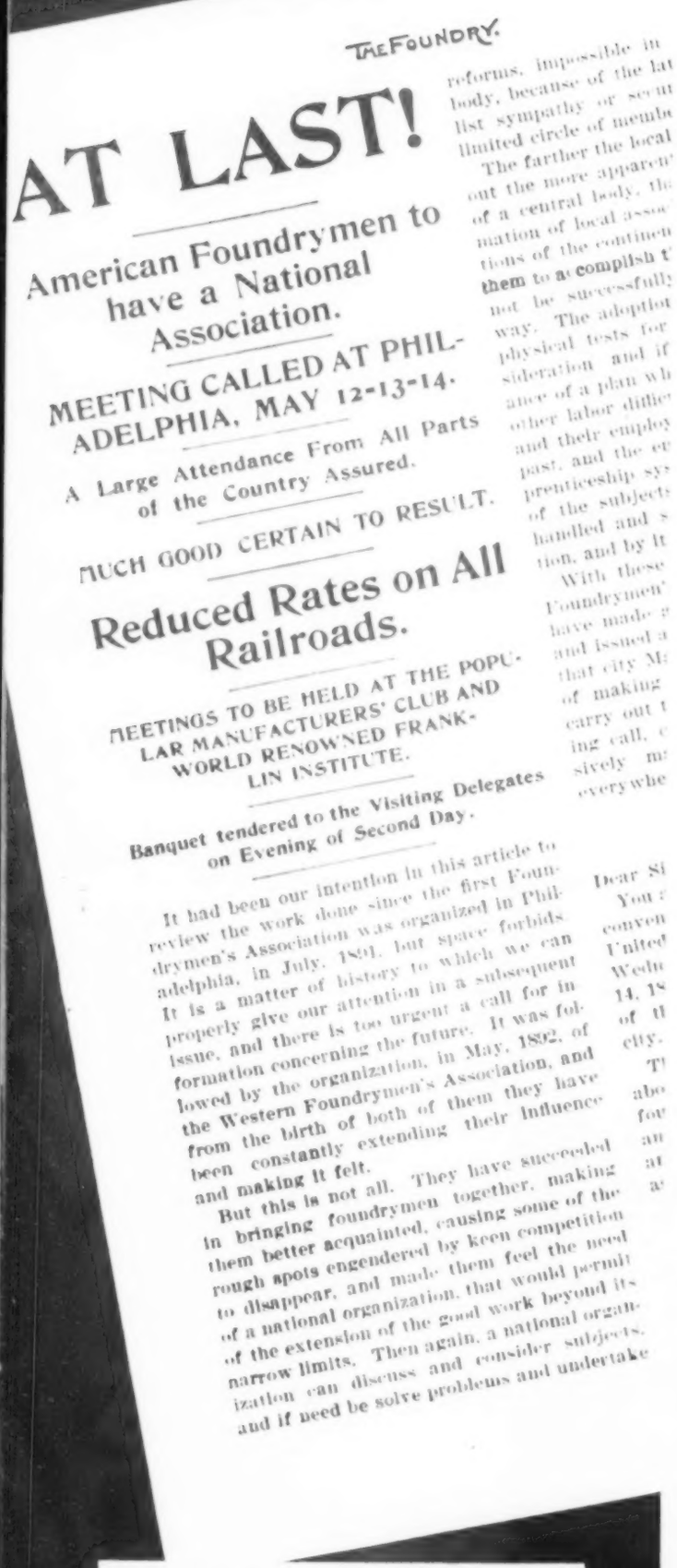
Although the men instrumental in calling the meeting and organizing the American Foundrymen's Association were endowed with a goodly heritage of vision, initiative and optimism, it is doubtful if the most visionary, pushing and optimistic member of the group had any adequate conception of the proportions to which the association would attain in the comparatively brief period, usually reckoned as two-thirds the life time span of the ordinary individual. Up until a few years ago several men who had attended the first meeting in Philadelphia June 14 and 15, 1896, were stepping around as hale and hearty as they were on that memorable occasion. What is even more remarkable their interest and enthusiasm never have waned throughout the years.

S INDUSTRY for 50 years

There is an old saying that nothing succeeds like success, and that probably accounts in large measure for the manner in which members, once enrolled, have remained in the association. It also accounts for the steadily expanding membership since like attracts like and a characteristic human trait is the desire to be identified with a live and progressive organization. The platform on which the association was organized seemed sufficiently broad, not to say positively ambitious, but the actual experience and performance since the organization period indicates that the infant, like many of the human species, has developed a height, a depth and a breadth of shoulder never remotely anticipated by the fond and loving parents.

The association does not claim all the credit for the advances in foundry practice made in the past 50 years, advances greatly in excess of that achieved in any similar period, but with all becoming modesty it may lay claim to the distinction of having played an active part. It has encouraged investigation and research and has served as a clearing house for the dissemination of information from every source. A glance over the technical program presented at any convention indicates, for one thing, the almost universal scope of the association's activities, and also shows in some measure the long road that has been traveled along practical and technical lines since the association held the first meeting with 345 members in Phil-

Part of the group (far left) which attended the first AFA convention 50 years ago in Philadelphia. At left is scene in downtown Cleveland, site of the 1946 meeting



THE FOUNDRY.

AT LAST!

American Foundrymen to have a National Association.

MEETING CALLED AT PHILADELPHIA, MAY 12-13-14.

A Large Attendance From All Parts of the Country Assured.

MUCH GOOD CERTAIN TO RESULT.

Reduced Rates on All Railroads.

MEETINGS TO BE HELD AT THE POPULAR MANUFACTURERS' CLUB AND WORLD RENOWNED FRANKLIN INSTITUTE.

Banquet tendered to the Visiting Delegates on Evening of Second Day.

It had been our intention in this article to review the work done since the first Foundrymen's Association was organized in Philadelphia, in July, 1891, but space forbids. It is a matter of history to which we can properly give our attention in a subsequent issue, and there is too urgent a call for information concerning the future. It was followed by the organization, in May, 1892, of the Western Foundrymen's Association, and from the birth of both of them they have been constantly extending their influence and making it felt.

But this is not all. They have succeeded in bringing foundrymen together, making them better acquainted, causing some of the rough spots engendered by keen competition to disappear, and made them feel the need of a national organization, that would permit of the extension of the good work beyond its narrow limits. Then again, a national organization can discuss and consider subjects, and if need be solve problems and undertake

Article from the April, 1896, issue of THE FOUNDRY announcing plans for the meeting where the AFA was formed

adelphia in 1896.

Advance along technical lines in the past 50 years is reflected vividly in the varied and interesting exhibits of foundry appliances, supplies and equipment which have come to be recognized as a feature of greater extent and importance with each succeeding year. The scientific foundryman has developed methods and processes for successfully meeting higher standards in quality and numbers; and the equipment and supply makers have supplied the tools and materials to meet his most exacting requirements.

In all probability the most complete history of the organization and the early days of the American Foundrymen's Association was prepared by C. E. Hoyt, for many years executive secretary-treasurer and manager of exhibits of the association and now treasurer and a most active participant in the arrangements for the Cleveland exhibition. The history was printed in full in a daily edition of THE FOUNDRY which was published during the 1926 International Convention and Exhibition in Detroit. The following is an abstract of that material.

Were it possible to assemble everyone of those men who gave their time and effort to support the first national meeting of American foundrymen in Philadelphia in 1896, it would be interesting to have their opinions as to their conception of the organization's purpose at the time of the birth of the American Foundrymen's association. Would these men give any of the fundamental principles which now actuate the A.F.A. as the reason for their interest in the first session? Could their perceptions in that early day have grasped the immense contribution which has been made in technical and business information, in bettered working conditions for mankind, in the broader service and usefulnes of cast products and in the fellowship among men of this industry due in large measure to the organization which they launched in the City of Brotherly Love, June 12, 1896?

Local Foundry Groups Existed

A number of local or regional organizations of foundrymen existed at that time, including the New England Foundrymen's Association, the Pittsburgh, Philadelphia, Western and Texas groups. These in a large measure devoted attention to technical questions, advising how to make molds and make mixtures, but with an additional field of interest in the state of business in the locality in which each operated. The two most prominent organizations of foundrymen in 1896 were the Western Foundrymen's Association with headquarters in Chicago and the Philadelphia Foundrymen's association, the latter of which is credited with being the father of the AFA.

This credit, by right, belongs to the Philadelphia group, since the first overtures toward holding a national meeting came from that source. In 1895, the first definite movement along this line took shape. At a meeting held on Sept. 3 of that year, Howard Evans, then and ever since that time secretary of the Philadelphia Foundrymen's Association, read a letter from the Western Foundrymen's Association in response to a communication from Mr. Evans, stating that the subject would be discussed at the western meeting to be held in Milwaukee the following month.

At that time it was the intention to hold the national convention in the association in the fall of 1895. How-

ever, the meeting of the National Manufacturers' Association and an exposition at Atlanta, Ga., in which many of the foundrymen were active, intervened and resulted in a postponement until the following spring.

One feature which sustains the opinion that at this time the organizers of the proposed national movement had no conception of the scope or trend of the great society which they were attempting to form is the fact that in no case in the report of the preconvention sessions is there any statement of purposes. Perhaps an exception might be made in the case of an editorial expression of opinion in THE FOUNDRY which seemed to forecast the technical direction of the organization's efforts, but of course was merely an advisory suggestion of future possibilities. This appears in the issue of April, 1896, and says briefly:

". . . . the formation of local associations in different portions of the continent and endeavor through them to accomplish those purposes that could not be successfully handled in any other way. The physical tests for cast iron work, the consideration and if possible the strikes, lockouts and other labor difficulties between foundrymen and their employes would be a thing of the past, and the uniform apprenticeship system, are only among a few of the subjects that could be successfully handled and settled by a national association and by it alone."

The call was sent out for a general convention. A list of names of members of the various group organizations, and individual foundrymen was assembled and these were circularized through the personal efforts of Howard Evans, secretary of the Philadelphia association, and John A. Penton, then editor of THE FOUNDRY.

In all of this advance material calling the convention, no mention was made of the purposes or aims of the proposed society, for no definite outline of such intentions existed. The announcements mainly stressed the idea that foundrymen should get together, that Philadelphia invited them and therefore they should come from the far corners of the country. The call was in the nature of an appeal for a social get-acquainted session, the urge was an unexpressed, but none the less urgent feeling of a need for some strong central group of foundrymen that might take thought of the industry as a whole and then develop a plan of action. But the meeting itself was the impelling thought. Columbus set sail, but he did not know his ultimate destination.

Delegates badge worn at the 1896 convention in Philadelphia

The first annual convention was called to order by Francis Schumann, president of the Philadelphia Foundrymen's Association at 2 p.m., June 12, 1896. In his opening address, Mr. Schumann called attention to the need, but not the aims of the association which they were to form. He said: "We are living in an era of conflict; on the one hand organized and concentrated capital; on the other, that which is scattered and disunited. Weak or partial organization will not prevail. Unless all engaged in an industry will unite and adopt vigorous measures that may be rigidly enforced for controlling individual members, the result will be failure."

Viewed in the light of thirty years' accomplishment, these words appear forceful, they express the urge to unite, but in no measure do they predict the trend or growth of the society. They might have been the pronouncement of a group of small manufacturers embarking upon some plan to defend themselves against the encroachment either of organized labor or united and predatory capital.

Later W. H. Pfahler, Abram Cox Stove Co., Philadelphia, emphasized this feature of great trade organizations in the past had been due to their having been started for a specific purpose and closed by remarking: "There was no purpose in bringing the present gathering together other than to give all a chance to talk over matters of interest."

However, significant of the future usefulness of the society was the presentation of a number of papers on foundry equipment, green sand molding, apprentice training and on the strength and chemistry of iron. The formal sessions were dignified, serious and forceful, and if testimony of attendants at the first convention may be taken as supported by infallible memories, the informal gatherings about the hotels and clubs were pleasant, lively and in a measure convivial. Such were the roaring days of '96.

At the closing meeting the following officers were elected: President, Francis Schumann, Tacony Iron & Metal Co., Tacony, Pa.; vice presidents, New England states, F. W. Gibby, Mechanics Foundry Co., Boston; Middle states, Robert G. Taylor, Wilson & Co., Pittsburgh; Southern states, Henry Clay Evans, Chattanooga, Tenn.; Central Western states, John M. Sweeney, Chicago Consolidated Iron & Steel Co., Harvey, Ill.; Southwestern states, W. S. Mosher, Mosher Foundry & Mfg. Co., Dallas, Texas; Pacific states, Irving Scott, San Francisco; Canada, Joseph Best, Warden King & Son, Montreal; secretary, John A. Penton, THE FOUNDRY; treasurer, Howard Evans, J. W. Paxton & Co., Philadelphia.

It will be recalled that in all reference to the proposed organization previous to the meeting in Philadelphia, the term national association was used. One of the first actions of the convention was to propose that the word American should be substituted, so that Canada might feel that the co-operation of foundrymen from the Dominion was desired and expected.

The meeting closed and the infant society, with an initial membership of 345 was delivered to the tender care and solicitude of its officers with no suggestions as to its care and raising.

During the first year little activity is evident, except in the direction of enlarging the membership to 500 and in printing and disseminating the proceedings of the first convention, under the title of *The Journal*.

At the second convention, which was held in Detroit, May 10 to 13, 1897, the exhibition idea made its first appearance, a number of important technical papers were read, including one from Europe, and two important resolutions were presented, which had a bearing upon the future direction of the society's activities. The first of these was a resolution to which (*Please turn to page* 206)

FLAME HARDENING Cast

By R. H. OLMSTED
Farrel-Birmingham Co. Inc.
Ansonia, Conn.

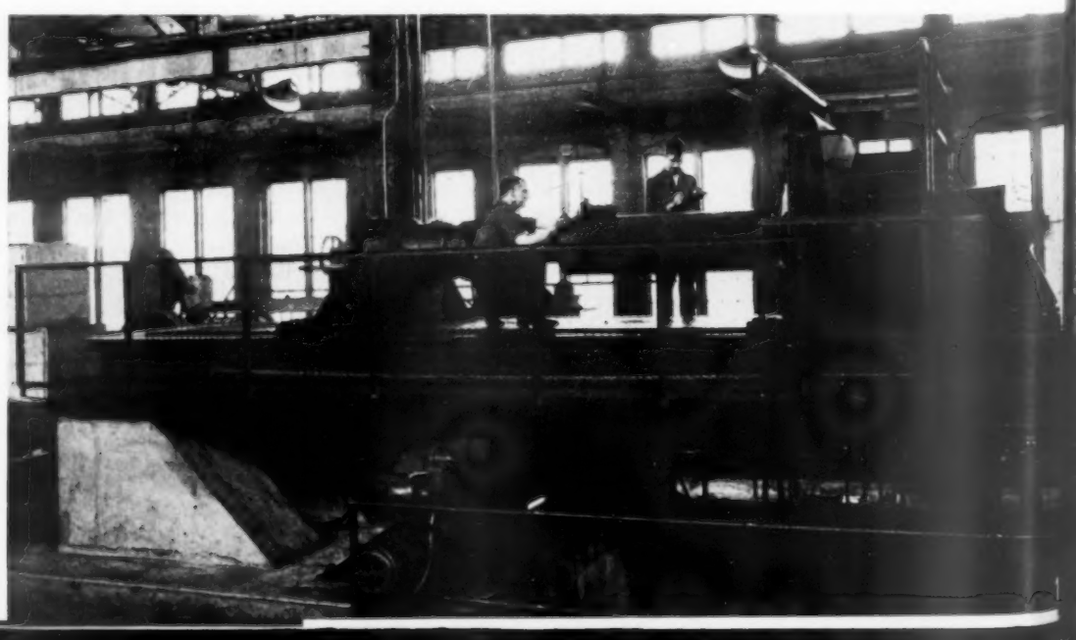
FLAME hardening can be defined in a general way as the process of heating the surface of a ferrous material above its critical temperature with an oxyacetylene flame and rapidly cooling this surface by means of a suitable quenching medium. The art of flame hardening, although employed for only about the last ten years as a production tool in the gray iron industry, has been exercised on steel for many more years by ingenious blacksmiths and toolmakers. Probably the principal item responsible for its development as a manufacturing process for gray iron has been the improvement in the oxygen and acetylene equipment which has made it possible to duplicate results.

Of the large number of analyses or compositions which are classified as gray iron, only those which have sufficient hardenability characteristics in the casting section are here considered for the flame hardening process. They are, principally, the so-called "pearlitic irons." These "pearlitic irons" usually have combined carbons in the range of 0.60 to 0.80 per cent depending upon the overall composition of the metal. This, of course, allows for innumerable compositions of irons, and the proper selection of the material for the process would be influenced by other properties such as hardness, tensile strength, machinability, damping capacity, and notch sensitivity.

Some of the gray irons suitable for flame hardening fall in the ASTM designation A-48, Classes 40, 50, and 60. Low silicon and, even more important, low total carbon compositions will favor maximum hardness, which, measured with a rockwell machine or scleroscope and converted to brinell, can attain hardness numbers in the range of 550 to 600. In Fig. 4, photo-micrographs of flame hardened Meehanite and a graph of brinell hardnesses at various depths from the surface may be noted. Sefing[1] suggested that, in a general specification of alloy irons for desirable flame hardening, the chemical analyses range should be: 3.30 per cent max. total C, 1 to 2 per cent Si, 0.60 to 1 per cent Mn, 1 to 2 per cent Ni and 0.75 max. Cr plus Mo plus V.

Specifications and standards on the materials to be treated are essential before any production system can be carried out with any reasonable amount of success. Flame hardening could be one of the last operations in the manufacturing process, and failure at that point would cause a great loss of both time and material.

Along with the type analyses best suited for flame hard-



Iron

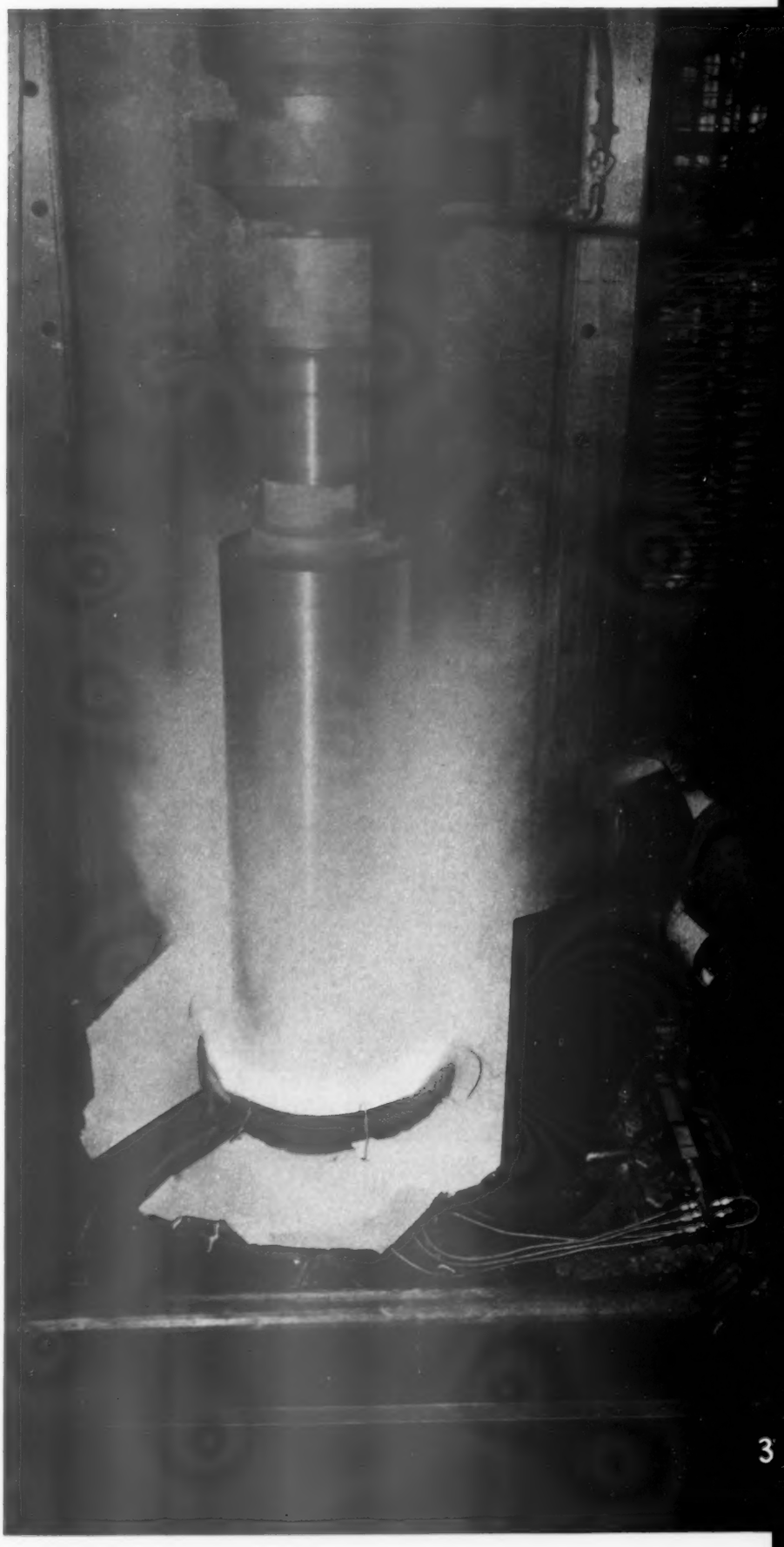
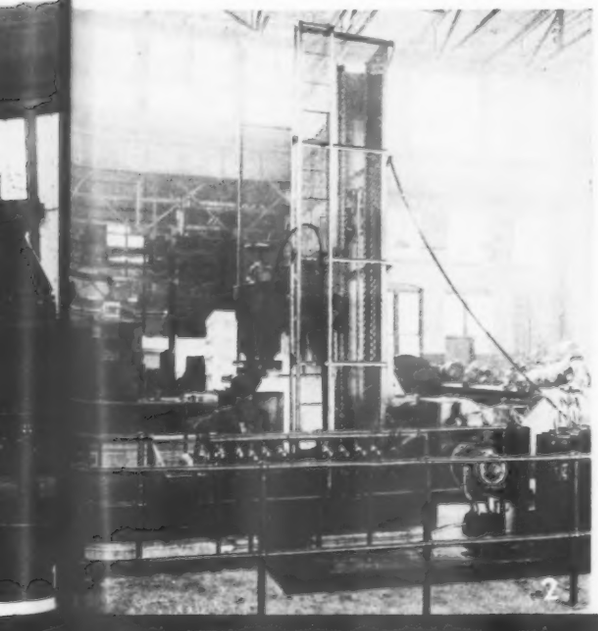


Fig. 1—Roll flame-hardening machine in horizontal position for setting up. Hardness readings shown being taken after roll has been processed

Fig. 2—Side view of roll flame-hardening machine in position for processing a roll

Fig. 3—Flame hardening a roll in the roll flame-hardening machine at the Derby, Conn., plant of Farrel-Birmingham Co. Inc.



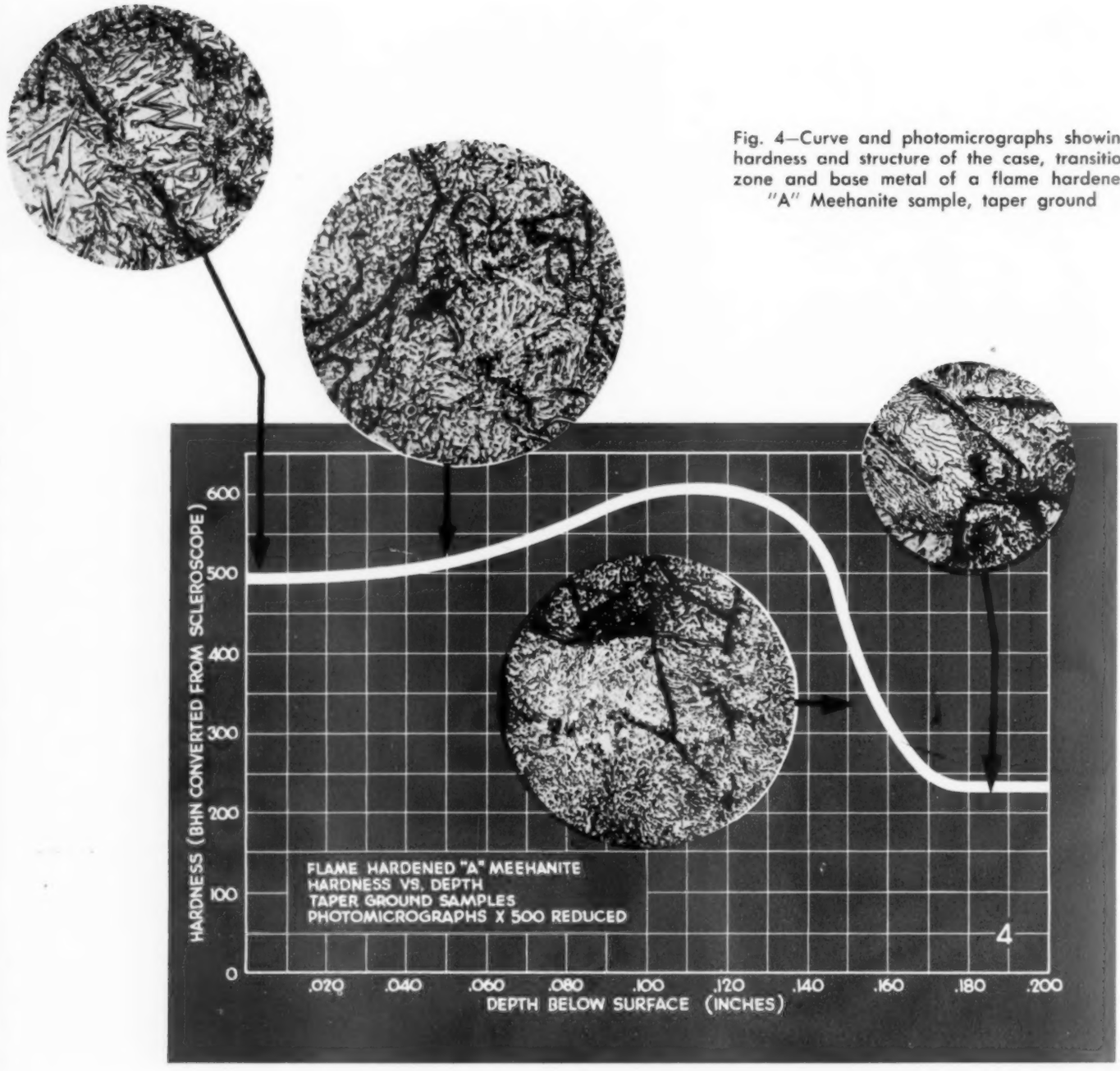


Fig. 4—Curve and photomicrographs showing hardness and structure of the case, transition zone and base metal of a flame hardened "A" Meehanite sample, taper ground

Fig. 5—Fixtures for grinding machines, a typical application of flame hardening to machine tool parts cast of pearlitic iron

Fig. 6—Chair seat dies flame hardened around edges to prevent scoring. Hardened area shows prominently as a bright strip about 1½ in. wide

Fig. 7—Rings being hardened by the progressive method

ening, a second basic consideration for the selection of iron castings is the item of cleanliness of the iron. The casting must be free of foreign materials, such as sand or slag, in the sections to be selectively hardened. Even small particles of sand which cannot be seen with the naked eye, will explode during the quenching and are liable to leave a rough surface if sufficient stock is not removed after hardening. Furthermore, minute porosity of the iron will increase the surface exposed to the exceedingly hot flame (6000 F or more) and may heat that area to a temperature at which sweating, or even melting, might occur.

Flame hardening of cast iron can be compared, on technical principles, with other forms of heat treating. As in any other heat treating process, it is of utmost importance that all conditions be accurately controlled. Speeds of torch and quench travel, oxygen and acetylene pressures, volume of quench, and the distances of the torch and quench equipment from the work are a few of the items which must be held within rather close limits. This is absolutely necessary in order to obtain any duplication of results because, even with all other conditions ideal, a slight torch adjustment, for instance, would vary the flame characteristics, which in turn would influence the case in contour, depth, and hardness. Speed of travel is often considered to be the most convenient variable for controlling the depth of case and the hardness.

It is necessary to keep in mind such factors as the hardenability, critical temperature, and heat conductivity of each type of iron, along with the fundamental standards and specifications. Heat conductivity might be watched to advantage more closely in torch hardening than in most other heat treating processes, due to the speed with which the temperature is raised to the proper quenching point.

Flame hardening of iron is generally performed on heavy castings thick in section or complicated in shape and unsuited for other methods of hardening. Figs. 1, 2 and 3 show various stages of a roll flame-hardening setup and give an indication of the size of casting which can be treated by this process. It is a portable operation in the sense that the heat is brought to the job rather than having the entire job placed in the heat as in most other heat treating processes.

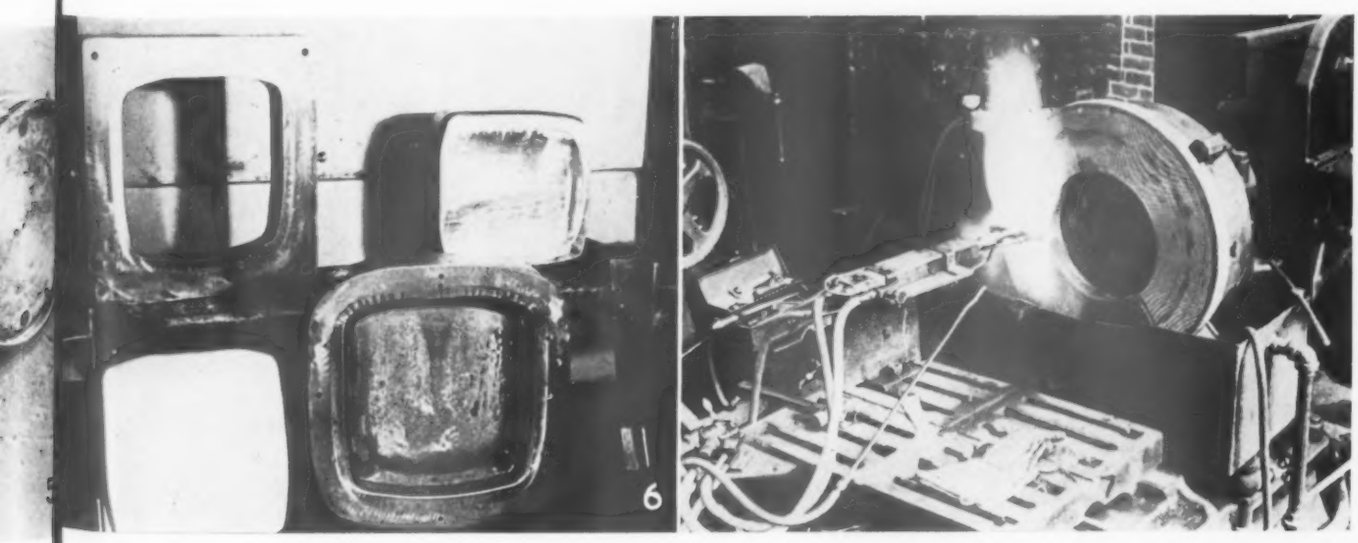
Again referring to Fig. 3, advantages such as heating only a relatively small section of the entire casting to obtain the desired results, and the flexibility of flame hardening, are obvious. Iron castings, which are subject to wearing action over a localized portion of their surface, can be treated by this process in order to improve wear resistance and thus extend the useful life. These items give some idea as to the reasons for the prominence of selective hardening by flame heating, from both an economic and a practical standpoint.

If wear resistance is the chief reason for hardening, only certain sections of the iron castings need hardness in most cases. The hardening of the castings in their entirety would make machining after hardening costly, if not impossible. On the other hand, in the flame-hardened part this machining problem would, if at all, arise in only the relatively small treated area. This is one of the major economic factors favoring selective hardening. The chair seat dies in Fig. 6 are typical examples of iron castings which can be advantageously flame hardened for wear resistance in certain sections.

Those experienced in the flame hardening of steel must realize, when hardening cast iron, that the melting point is considerably lower than in the case of steel. Because of this fact, the procedure for steel must be adjusted or cast iron, when treated similarly, will show signs of sweating or even melting, especially in applications where a depth of case in excess of ⅛-in. is desired.

Most cast irons have shown little susceptibility to heat checking when properly flame hardened, but in cases where local overheating might occur definite precautions are necessary. In the vicinity of sharp edges, the intense heat of the flame will supply more than sufficient heat input, and therefore the flame should be kept some distance away from the edges in order to produce uniform heating over the entire area to be hardened. Drilled or tapped holes may be protected by means of such materials as asbestos, carbonaceous products, or even graphite inserts. Such precautions have often prevented excessive stress concentrations during flame hardening.

It is unfortunate that, up to the present time, no practical method for the measurement of the surface temperatures of flame hardened parts has been used to any great extent. Without some such basis for regulation, the rapid heat input of an oxyacetylene (*Please turn to page* 284)



By L. J. FLETCHER
Caterpillar Tractor Co.
Peoria, Ill.

Community Relations

Winning the respect and confidence of the community will pay dividends to both the individual company and industry as a whole. The author describes Caterpillar Tractor Co.'s program for attainment of better community relations

THE large majority of business men will subscribe to the statement that definite benefits result when their company and the individuals who comprise it are able to win and hold the respect and confidence of their particular community.

American business *wants* to be understood! Those men who put in long, honest hours doing the work of guiding industry would like nothing better than to know that their tasks are understood by others. With such understanding, industry would gain many friends, for people are far less likely to dislike those they know than those they do not.

At the same time, many of these same men either are unaware of the attacks being made on industry's way of doing business and on industry's goals, or are indifferent toward these attacks because, they say, "these statements are not true and will not be believed" or "this doesn't reflect the views of those engaged in this great undertaking."

Others, however, are deeply concerned over the gap which is widening as a result of the misunderstandings between free business institutions and great groups of people. They are concerned and disappointed that these groups do not understand the tremendous contributions these enterprises have made toward the well-being of every individual in this great country.

The real question, then, is "How can understanding be developed and confidence recreated, on the part of the general public, in the demonstrated ability of our free industrial system to best serve all people in the future?"

There is but one way this job can be done! There is but one place it can be done! And there is but one group which can do it! The job must be done *in each community, by the men in the industries and businesses of that community!* The busy business executive can no more write a check and buy public goodwill than he can com-

This portable art exhibit included originals of paintings used in the company's national advertising and publications

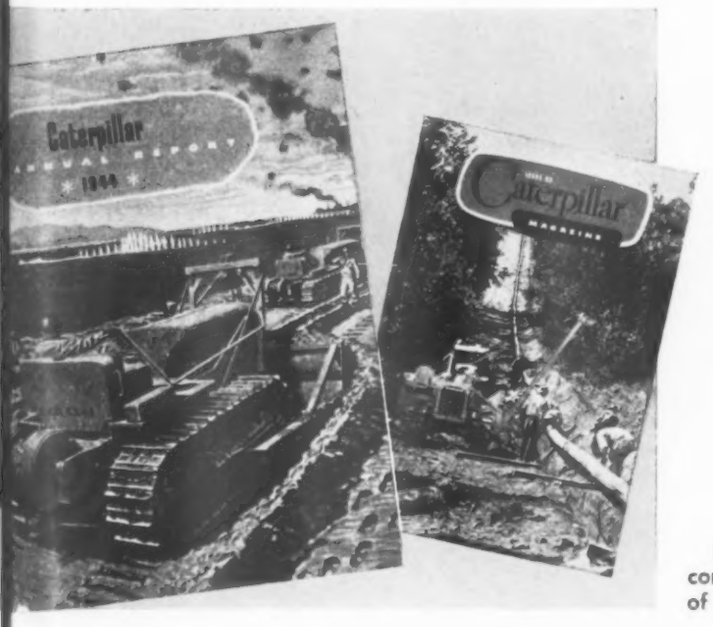
mission a friend to sell his sterling qualities as a potential husband. The "Miles Standish" business man *must* speak for himself.

The message he must bring to those in his community is not an abstract one which dwells at great length on dry economics. It is a simple explanation of industry as it operates at home under our American system—the advantages of that system which makes it possible for us to work in areas of our choice, at the kind of job we want, at the kind of pay which will let us own our own homes and cars and radios.

In our own communities, we really can be known as individuals or people. Outside our communities industry is known as products or services. That is to say, in the places where our employees live, people think of individuals when they think of our company. In the next state, or in another country, they think of the product we make or the service we render, when our name is mentioned.

Caterpillar Tractor Co. established a Community Relations Division the latter part of 1944. Its field of activity is distinguished from that of public relations in that it is concerned with matters of mutual interest to the company and the people in the approximately 100 towns and surrounding country in which employees make their homes, whereas Public Relations, which is part of the Advertising Department, is primarily concerned with publicity on products and is national and international in scope. A third department, Industrial Relations, supervises those things which affect employees, including personnel and employment, labor relations, insurance, safety, medical treatment, sports and hobby activities and employee publications.

Attainment of the Community Relations Division's main objective of developing and maintaining the community's respect and confidence is sought, in general, by (1) keeping the community correctly informed of all company news in which it is interested or concerned, (2) co-operating with the people of the community in all affairs concerned with civic growth, improvement and well-being, (3) fostering and encouraging a (*Please turn to page* 296)



Publications such as these help to give community leaders a better understanding of the company's aims and policies

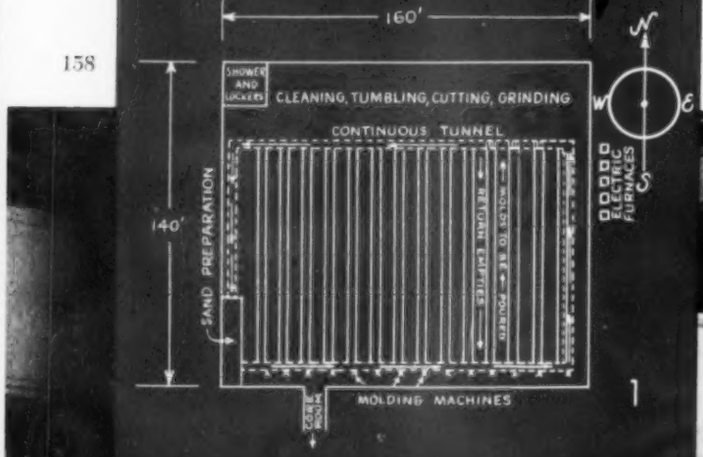
NEW BRASS FOUNDRY

Typifies Modern Design

MANY factors, including the crowded and congested conditions under which operations were pushed to and beyond capacity in the recent hectic war years, induced the H. B. Salter Mfg. Co., Marysville, O., to erect, equip and place in operation a complete new brass foundry adjacent to and in the rear of a plant that has been in existence for 42 years. It is confidently anticipated that better working conditions, increased output and reduced operating cost will amortize the capital expenditure in less than three years. Based upon the results of a few months' operation the anticipation is claimed to be within conservative limits.

A handsome new office building, faced with light yellow brick, extends across the front of the plant. Part of the second floor is occupied by the engineering department, laboratory, and sand testing equipment. The ground floor is partitioned into a series of offices on both sides of a

By PAT DWYER
Engineering Editor
THE FOUNDRY



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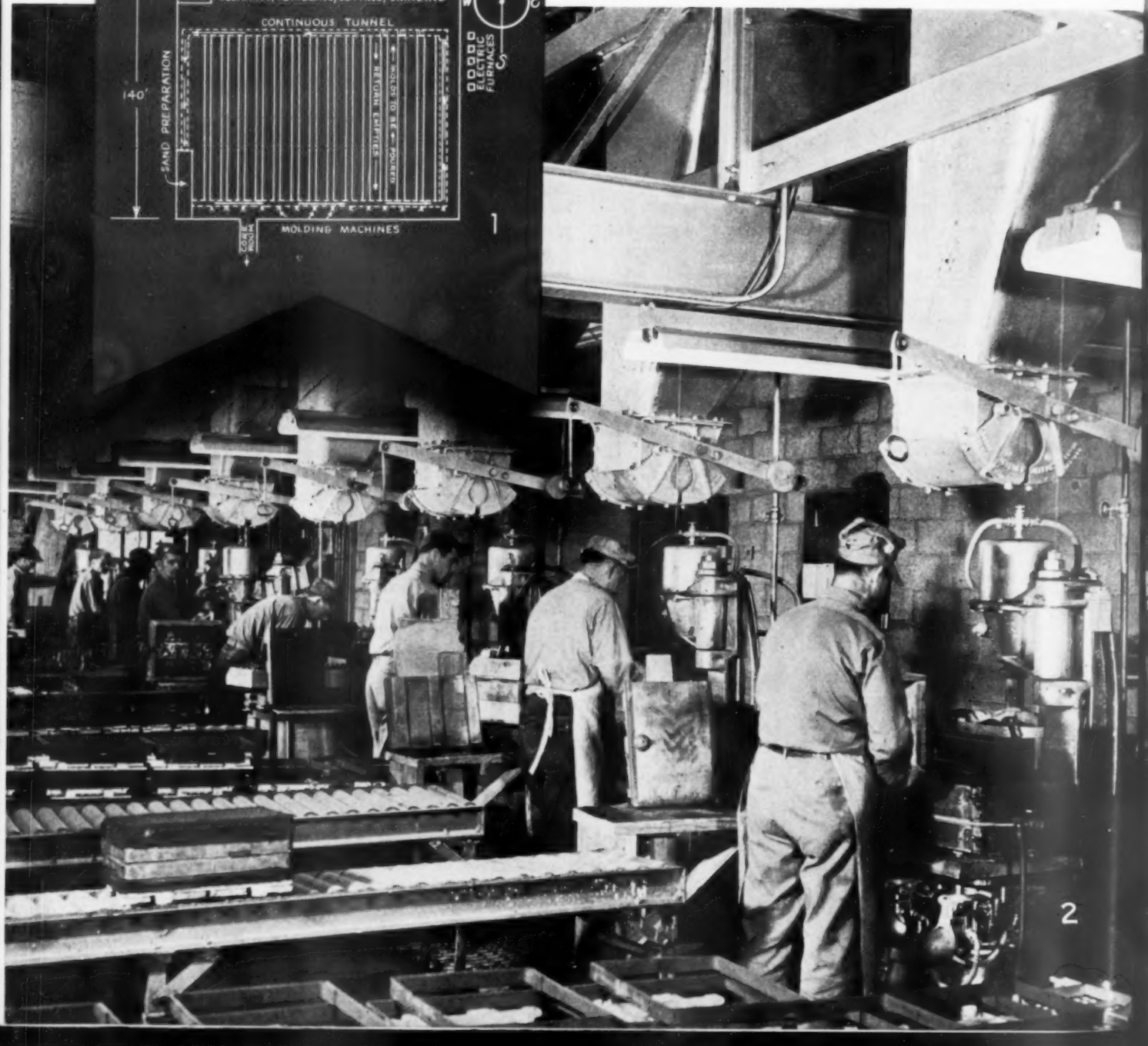

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central corridor.

Flair of the management for attractive surroundings, in keeping with the manufacture of high class and gleaming plumbing supplies is reflected in the new foundry where the smooth cement floor is as clean as the deck of a battleship. An unconfirmed rumor is to the effect that a new employee recently discharged from the Navy glanced suspiciously in every corner for a sight of the deck mop and holystone. Foundry rumors are notoriously unreliable, but the floor is exceptionally clean with the exception of two comparatively small areas, one in the vicinity of the battery of molding machines, where a small amount of sand is spilled on the floor, and the other at the line of shakeout stations, where every particle of sand does not fall immediately through the grating.

The fireproof building, 140 x 160 ft, is amply lighted and ventilated through extensive windows in the side walls and in the monitor type roof. North and south walls are built of concrete blocks, and the steel frame supports an insulated metal deck roof. The north wall separates the foundry from the remaining and older part of the plant. The south wall separates the foundry from the coreroom. A wide gangway connects the two departments.

A tunnel, 8 x 8 ft, extends under the floor and embraces the space occupied above by the molding and conveyor units. Gratings in the floor over each branch of the tunnel conduct all spilled sand down onto a moving belt which eventually carries the sand back to the sand preparation plant with capacity for handling 30 tons per hour. Commencing at the southwest corner of the building, the first branch of the tunnel extends under the floor in the vicinity of the battery of 14 molding machines. The belt in this tunnel catches all surplus sand spilled on the floor, also surplus sand traveling on the overhead belt

Fig. 1—Sketch, not drawn to scale, showing general layout. Fig. 2—Battery of squeezer molding machines in a line close to the wall is served by overhead sand hoppers and by roller conveyors that carry the molds to the pouring stations and return the empty bands. Fig. 3—View from opposite end of conveyor lines

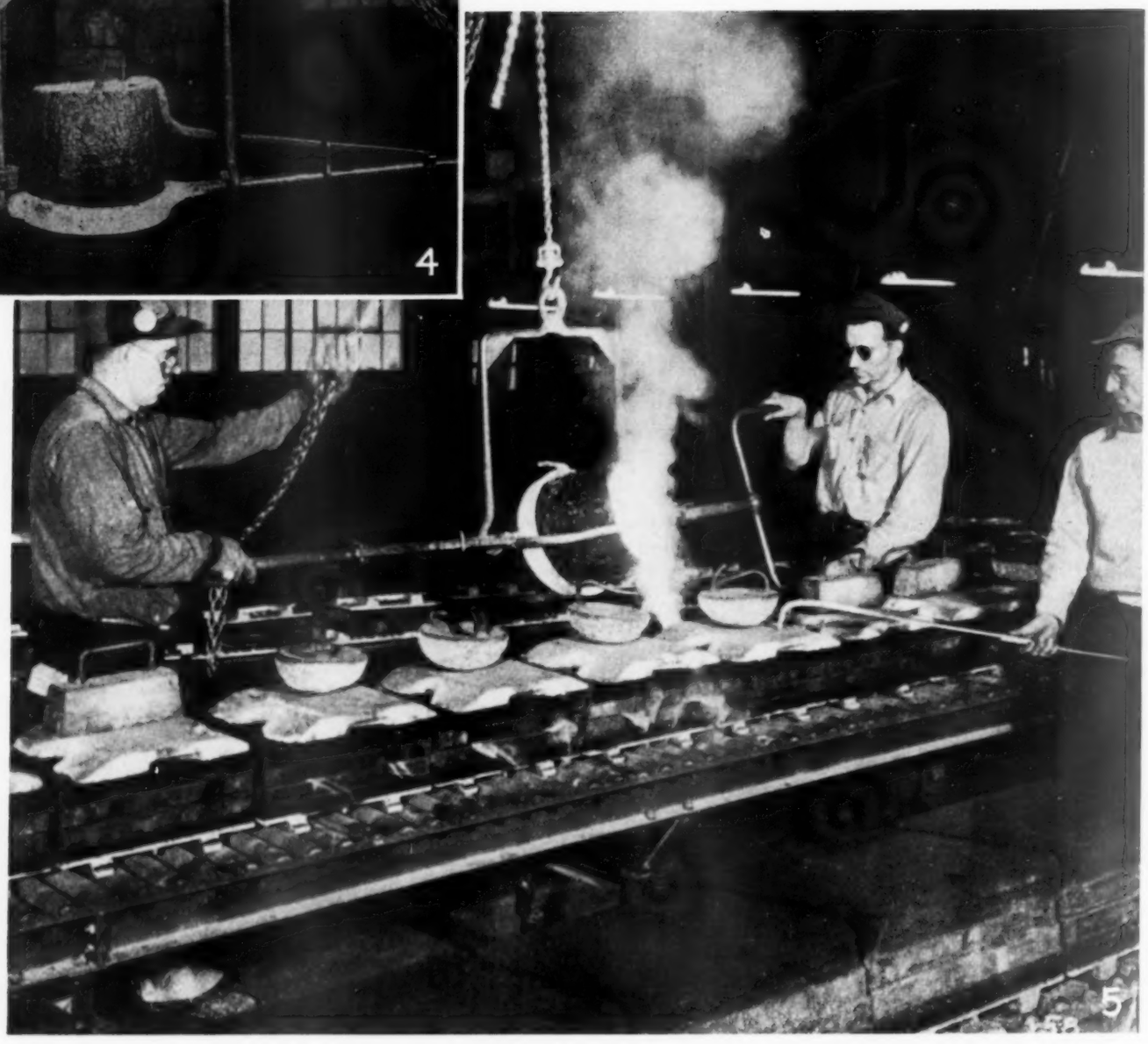


Fig. 4—Every precaution is taken to hold the crucible firmly in the shank suspended from a monorail hoist extending over every floor

Fig. 5—Metal from a battery of electric melting furnaces in an adjoining room is distributed on a schedule that prevents overcrowding any of the conveyor units

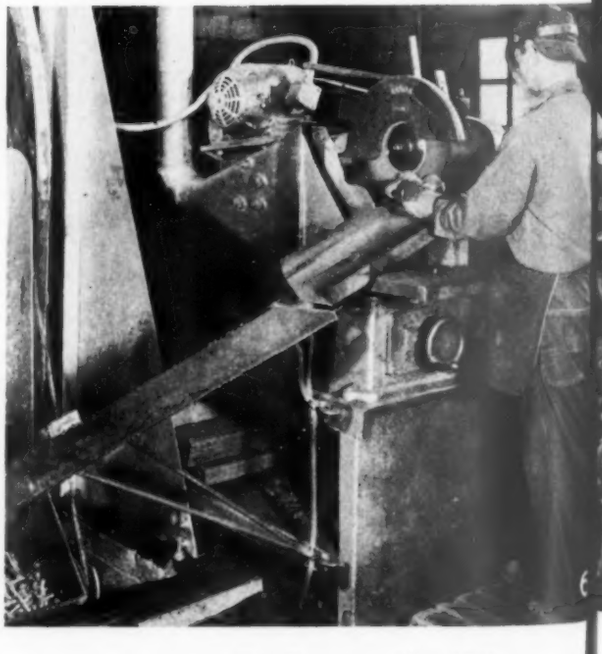
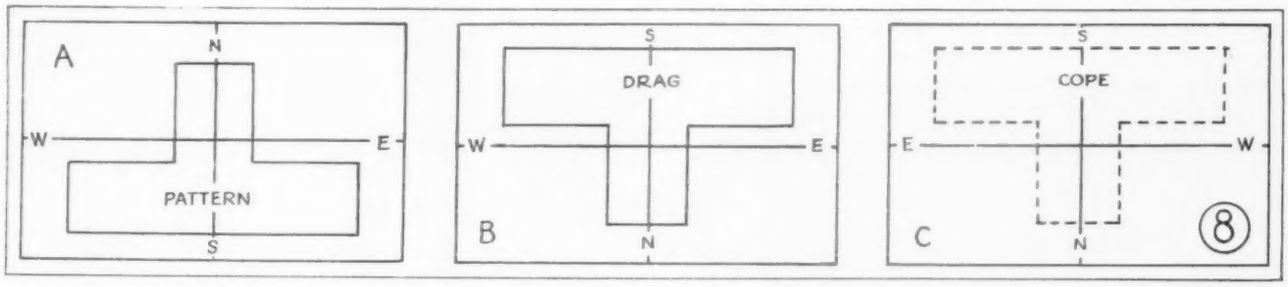


Fig. 6—Gates and risers from certain castings are removed by a thin abrasive disk. The scrap falls into a box at one side while the castings slide down a chute into the loading pan of a tumbling device.

Fig. 7—Molds are shaken out over a grate at the end of the conveyor line

Fig. 8—Drag and cope are rammed on one face pattern plate

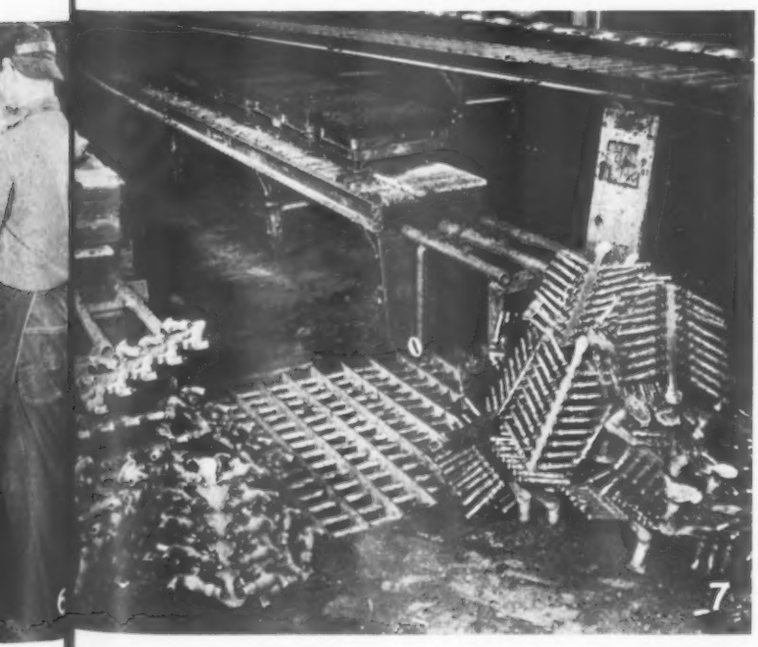


which feeds the individual hoppers over the molding machines.

At the extreme eastern end of the first unit in the tunnel, the belt discharges accumulated sand onto a belt in the second section of the tunnel running at right angles to the first section. This belt carries the sand north and discharges onto the belt in the third tunnel section. The belt in the third section of the tunnel catches all the sand falling through the grates in the floor at the end of each conveyor line, and carries the load to the fourth tunnel section, where the sand is transferred to a belt traveling south and discharging into the boot of an elevator. Sand at various stages travels east, north, west and south, but the movement constantly is forward and terminates at the sand mixing plant, a somewhat elaborate installation occupying space in the southwestern corner of the building. An adequate exhaust system draws all steam, dust and smoke into the tunnel and keeps the atmosphere clean throughout the foundry.

Owing to the light weight of the castings, the amount of dust and steam, even at the shakeout stations is not excessive and hardly would receive either comment or notice in the ordinary foundry. Light castings do not burn or dry the sand to any great extent, therefore reconversion to workable use does not involve many factors that complicate the problem in foundries where heavy castings and high temperatures prevail. The elevator discharges the sand on a vibrating screen which breaks any lumps and removes core butts, scrap metal and random scraps of foreign material. The sand then enters a large storage hopper with feeding device at the bottom which passes the sand in measured amounts into a pug mill. Water in proper amount is added to the sand in the pug mill. Any other necessary adjustments in physical properties also are made at this stage. Sand in this foundry is from the Albany, N. Y., district. It is graded as No. 0, and conforms to the following specifications when prepared for use in the molds: AFA fineness 160, green compression 5 to 6 psi, permeability 12, moisture content 6 per cent. Since the sand is not burned to any appreciable extent in contact with the light castings, it is easily kept up to the required strength and volume by the occasional addition of small quantities of new sand from time to time as needed.

From the sand preparation plant the sand is carried aloft and discharged onto a long belt traveling over the open tops of a series of hoppers which serve the battery of molding machines. Adjustable plows above the surface of the conveyor direct the sand as desired into the various hoppers to maintain a constant supply for the molders working on the machines. The opening at the bottom of each hopper is controlled by a gate which delivers a measured quantity of sand each time the molder pulls a lever.



Molds Are Made on Machines

Molds are made on plain, air-operated squeezer machines. Split patterns are mounted on both sides of aluminum pattern match plates. In the sequence of operation the molder places the pattern plate on the table of the machine, removes loose sand with a blast from the air hose, sets the drag half of the snap flask on the plate and drops a steel band inside the flask to serve as reinforcement, shakes a little parting dust from a bag, pulls the overhead lever to fill the flask with sand, sets the aluminum bottom plate in place, brings the swinging head of the machine to a point above the mold and squeezes sand and bottom plate into the flask, removes assembly, rolls it over and replaces on machine table, sets cope half of flask in place and repeats operation, removes cope, removes pattern plate, sets cores if necessary, closes mold and places it on conveyor line.

On three machines the pattern equipment differs to some extent from the foregoing. Half patterns are mounted on one side of the pattern plate and serve to make drag and cope separately and in succession. The method is better adapted to some types of patterns than to others. The principle and general features are shown in Fig. 8. The pattern must be symmetrical and mounted on the pattern plate or board in definite re-

lation to two center lines *NS* and *WE* so that the cope and drag sections of the mold will coincide properly when the mold is closed. The upper sketch *A* shows the pattern plate with pattern in place. The center view *B* shows the face of the drag as it appears after it is rammed full of sand and rolled over.

Obviously, the cope half of the mold, rammed on the same plate, must be manipulated or adjusted in some manner to insure proper alignment of the upper and lower mold cavities. The cope is not rolled over. It is lifted from the plate, turned end for end as shown at *C* and lowered onto the drag. The foregoing applies to patterns in which the perimeter is irregular and certain points lie at different distances from the two center lines. For disks or other shapes where the perimeter is at a universal distance from the center, it is not necessary to turn the cope end for end in closing the mold.

Steady, uninterrupted and maximum production within the capacity of the operator is assured by a double-line gravity roller conveyor extending from each molding machine for a distance of 65 ft. One branch of each conveyor inclined slightly downward from the machine end to the shakeout, has a holding capacity of 50 to 75 molds depending on whether they are set up for side or end pouring. With a constant supply of metal arriving from the furnaces, the molds on each conveyor are poured before the entire length is filled. The slight down grade on the conveyor facilitates the movement of the line of molds constantly replenished from the molding machine at one end.

A specially designed aluminum bottom plate prevents possible distortion from the sand in one mold coming into contact with the mold immediately ahead or behind on the conveyor. The bottom plate is generously provided with ½-in. vent holes for the escape of gas and steam; it also is reinforced with longitudinal and transverse ribs and

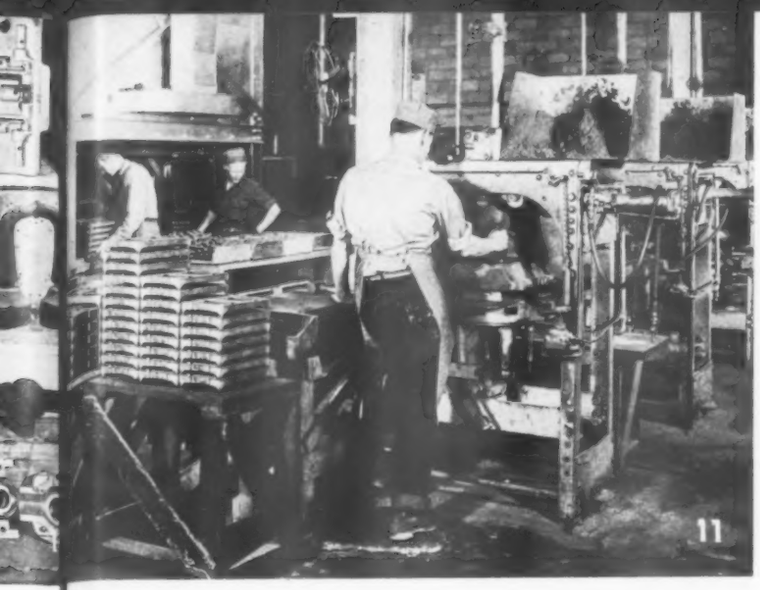


Fig. 9—Myriads of small cores from the vertical oven are sorted, inspected and loaded in trays for distribution by girls standing at a long bench

Fig. 10—Typical group of blow plates, dryer shells, cores and ingenious metal coreboxes

Fig. 11—Nearly all cores are made on a battery of coreblowing machines and are dried while resting in metal supports to prevent distortion

with two small extensions on each side and on each end. The extensions on one plate come into contact with similar extensions on the plate ahead and behind. The ribbed formation rides on the conveyor rollers and eliminates the use of plank sections or other devices. A slight push on the last mold moves the entire line forward.

With this arrangement each group of molds temporarily is stationary while the pouring crew is filling the molds with metal. Contents of a No. 70 crucible, capacity 220 lb, will fill 12 to 20 molds depending on the size and weight of the castings. The average yield of good castings is 70 per cent of the weight of metal melted. In this instance about 10 tons of metal is melted to secure a daily output of 8 tons of castings.

In keeping with a general good-housekeeping policy, which naturally includes all reasonable precautions for the prevention of accidents, the crucible bail and shank are provided with safety devices as shown in Fig. 4. A piece of steel plate, welded at the neck of the bail immediately below the chain hook, and another piece welded inside each upper shoulder prevent the bail from spreading through constant service. A two-part clamp, one part attached to the shank and the other part free to swing back and forth, holds bail, shank and crucible in rigid upright position while the unit is in transit between furnace and molds. The part which embraces the upright bail member is swung out of the way while the man at the double end of the shank is pouring metal into the molds.

The bent end of a steel bar rests on the opposite side or top edge of the crucible. This bar is attached by bolt and pipe clamp to the shank. A steel link embraces bar and shank. The upper side of the bar carries a series of serrations or shallow rack teeth, which engage the upper part of the link at any desired point to coincide with variations in the height of different crucibles. The device holds the crucible firmly in the shank while the operator at the double end of the shank gradually tips the crucible from the vertical to the horizontal position.

In the old foundry the metal was melted in a battery of 13 gas-fired, pit type crucible furnaces. The same equipment served the new foundry for several months during the inevitable delay while waiting for the installation of a new battery of five horizontal, rocking type electric furnaces, each with a capacity of 500 lb. The new furnaces have been in operation since the first of the year. Transformers and all auxiliary items are housed in a chamber under the floor.

During the war years, when the company was engaged in work for the government, it was not uncommon to melt eight different mixtures to meet the requirements of a wide range of castings. Following the termination of this work and return to the production of its regular line of plumbing supply items, the metal poured into all castings is 85-5-5-5 alloy. No outside or foreign scrap is incorporated in the charge made up entirely of ingot metal and return scrap, gates, sprues, etc., from the shakeout and cleaning room.

Metal Is Distributed Efficiently

Method and equipment for distributing the metal to the molds on the long conveyor lines is highly efficient. A tramrail system extends over all the floors. The main line begins over and in front of the furnaces in a room adjoining the east side of the foundry. Hand-controlled switches all along the line divert the crucible to any desired line extending above the gangway separating the conveyor lines. The crucible is suspended from a small chain hoist manipulated by the man holding the single end of the crucible shank. The third man in the group manipulates the skimmer where necessary, and between ladle trips shifts the weights from the poured to the unpoured molds. The arrangement seems to represent the maximum in simplicity, efficiency and economy.

The second unit of each pair of conveyors with a fall of 2 ft from outer to inner end, carries steel bands and aluminum bottom plates from the shakeout to a point within easy reach of the molder on the machine. He simply turns around and picks them off in succession as he needs them. The shakeout end of the conveyor is shown in Fig. 3. As each mold reaches the end of the line, an attendant flops it over into three pieces of 2-in. steel pipe mounted on two angle iron frames. The sand falls down through a grating in the floor and through a chute to a belt in the tunnel. The castings remain on the pipes until they are pulled onto the floor with a hook in the hands of the operator. The bottom plate and steel bands are placed on the adjoining unit of the conveyor which carries them back to the molding station.

From the shakeout the castings are taken across the floor and separated from the gates either on a sprue cutter which nips them off one at a (*Please turn to page* 294)

Mass Production of Precision

By WILLIAM G. GUDE
Associate Editor
THE FOUNDRY

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MOST references to the relatively extensive use of precision castings in war production have pointed out that the basic practice in making them is centuries old and, prior to the war, had been used rather widely by dentists and jewelry manufacturers. However, it is obvious that without the intensive development of the process under the pressure of war demands, the precision casting would not have attained the position it occupies today as a product finding constantly increasing industrial applications.

The outstanding accomplishment in wartime production of precision castings was the adaptation of mass production methods to a process which previously had been employed for tailor-made products. That mass production actually was attained is indicated by the fact that the Haynes Stellite Co. alone made a total of approximately 25,000,000 cast turbo-supercharger buckets at its Kokomo, Ind., plant during the war and reached a peak output of 2,100,000 of these castings in April, 1944. In addition, it produced hundreds of thousands of ordnance parts, 100,000 turbine blades and turning vanes for jet engines used in the P-80 Shooting Star, and many thousand axial flow compressor blades. Add to these totals the many precision castings made by other producers, and it is evident that precision castings have definitely emerged from the laboratory stage to achieve comparative maturity as an engineering material.

Haynes Stellite Co. had made precision castings experimentally by the lost wax process since 1937 but did not start large-scale production until this country entered World War II, when tremendous demand developed for aircraft engine turbo-supercharger buckets. These parts, subjected to high stress at elevated temperatures, required a special alloy which is strong, even at high temperatures, and consequently difficult to fabricate, and casting to close tolerances was the logical method for producing them. The company had been engaged since 1934, in co-operation with the Thompson Laboratory of General Electric Co., in development of high temperature alloys for turbo-supercharger buckets, and this work led to standardization on Stellite No. 21 alloy, a modification of the cobalt-chromium-molybdenum dental alloy known as Vitallium (originally developed by Haynes Stellite in 1929 for Austenal Laboratories Inc., New York), for the type B turbo-supercharger buckets. Mass production techniques were developed originally for these buckets; later they were adapted to other parts required in the war effort and now are employed for making a variety of castings used in numerous industries.

It should be understood that precision castings claim a definite market but one which also has its limitations. They are primarily advantageous for shapes or alloys which are difficult to form, machine, grind or forge. On the other hand, the precision casting process cannot compete with conventional screw machine operations when only an easily machinable metal is required for a part of regular contour. Alloys having strength and hardness at high temperatures and resistance to abrasion heat or corrosion have always

Castings

Fig. 1—Patterns on assembly line of the wax department give some indication of various sizes of precision castings made by Haynes Stellite Co., Kokomo, Ind.

Fig. 2—Wax used for patterns in the precision casting process is carefully blended from raw materials, molded into blocks and later remelted as needed at wax injection stations

Fig. 3—One of the steps in making the die into which wax is injected to form the pattern

Fig. 4—After cores are placed and the die closed, wax is injected from this "gun" by a pneumatic ram

Fig. 5—Removing wax pattern from the die. The wax gate is broken off by hand

Fig. 6—Welding blind risers to wax patterns

Fig. 7—This operator is mounting two wax patterns on a main gate with wax runners

presented certain problems in transforming them into finished parts. Their melting points are too high for die castings; they cannot be cast by usual foundry methods into intricate shapes of close dimensional accuracy, and extensive finishing of complicated parts is too slow and uneconomical for mass-production quantities.

Haynes Stellite Co. makes precision castings in a wide range of sizes. For intricate shapes a soft metal die is made, and the maximum size obtainable currently with this type of die is approximately 10 x 12 x 5 in.; if the part is simple in shape, and a die can be made from some easily machinable material, larger parts can be produced. There is no minimum weight, provided the casting meets other

Fig. 8—Pattern assembly is dipped in fine silica suspended in a suitable medium. Eventually this coating becomes the surface adjacent to molten metal in the mold

Fig. 9—Somewhat coarser grains are screened onto the dip coating

Fig. 10—Entrance to the dehumidifying tunnel through which the assembly travels on conveyor belt and dries in 22 minutes

Fig. 11—Dried assembly is placed in a cylindrical alloy steel flask, which is sealed to the pattern bottom plate

dimensional minimum requirements such as wall and edge thicknesses; castings weighing 0.002 lb are not uncommon. The maximum weight depends on how the metal for the part must be poured. If the gravity-pour method can be used, the weight is limited only by the dimensional limits given previously. If pressure casting is desirable to assure proper feeding of thin or intricate sections, the maximum weight for the finished part is now about 5 lb.

The minimum practical wall thickness the company casts is about 1/16-in., although thinner walls have been made. About 0.012 to 0.015 in. is the minimum practical edge thickness, provided the casting otherwise lends itself to thin edges. A small-diameter, shallow hole (¼-in. diameter by about ½-in. deep) generally can be held to a tolerance of ±0.003-in. on both the location and diameter of the hole. The minimum size hole that can be cored depends on the amount of surrounding metal. A small hole which can be cored in a light section is often impracticable in a heavy section. The best working minimum is 0.050-in., even in light sections. Dimensional tolerances to which the castings can be held depend on the size and contours of the part, but generally 0.005 to 0.010-in. per inch of dimension can be held on the part as cast. On surfaces that must be finished by machining or grinding, an allowance of 0.015 to 0.040-in. for the part as cast is sufficient.

Various alloys are used by the company for precision castings, the material selected depending upon the properties required to suit a particular application. These alloys include stainless steels, cobalt-base alloys, nickel-base alloys, various high-temperature alloys, and a chromium-manganese-iron composition designed to resist abrasive wear and severe impact.

Among some of the applications for which the company has furnished precision castings in recent months are: reciprocating slide for cloth cutting machines; fuel parts for aviation carburetors; shoe caulks for racehorses; zipper slides and squirrel cages; a claw used in movie camera projectors; canning machine parts; a pawl used in a rock drill; diesel engine parts, including pre-combustion cups; cut-off neck rings for glass molds; pulverizing equipment parts; aircraft engine parts, including the 1 1/3-lb exhaust coupling shown in some of the accompanying illustrations; rayon machinery parts; spray nozzle cap, core and body.

With the end of the war the company faced many additional problems in adapting its high-speed precision casting process to a multitude of jobs of thousand-lot size instead of one job in million-lot quantities. To assure efficient handling, every new job is "pre-engineered" before it goes to the plant. A group composed of production, engineering and sales representatives fills out a tentative plan for production. This plan sheet follows the work through each production department and any alterations are noted on it; the sheet then is permanently filed for future use.

Development and production of precision castings are correlated through a four-part arrangement. First, there is a pilot plant at Union Carbide & Carbon Research Laboratories, Niagara Falls, N. Y., where fundamental problems connected with precision castings are investigated. Secondly, a pilot plant at Kokomo is more directly concerned with current production problems and with the development of some of the fundamental ideas worked out at Niagara Falls. Thirdly, a Specials or Semiproduction Department establishes gating procedures and develops production techniques. Each new job placed with the company goes to the Specials Department and sample castings are made, trying one or more gating techniques. Once the gating procedure is established, the job is turned over to the fourth department of the quadruple setup, the

Fig. 12—Filling the flask containing the wax assembly with a chemically-hardening investment material

Fig. 13—Flasks containing the investment mix are vibrated for an hour to eliminate air and pack the material tightly around the pattern

Fig. 14—Shaking out a poured mold after about 4 hours of cooling. The hard investment material requires a pneumatic hammer to remove the casting assembly

Fig. 15—Continuous furnace in which the wax pattern assembly is melted out of the mold. Heating is conducted for several hours at 1300 to 1900 F

Fig. 16—Mold being placed on electric furnace preparatory to pouring. The furnace melts sufficient metal for one mold. Pouring is accomplished by inverting entire furnace, and metal feeding is aided by air pressure

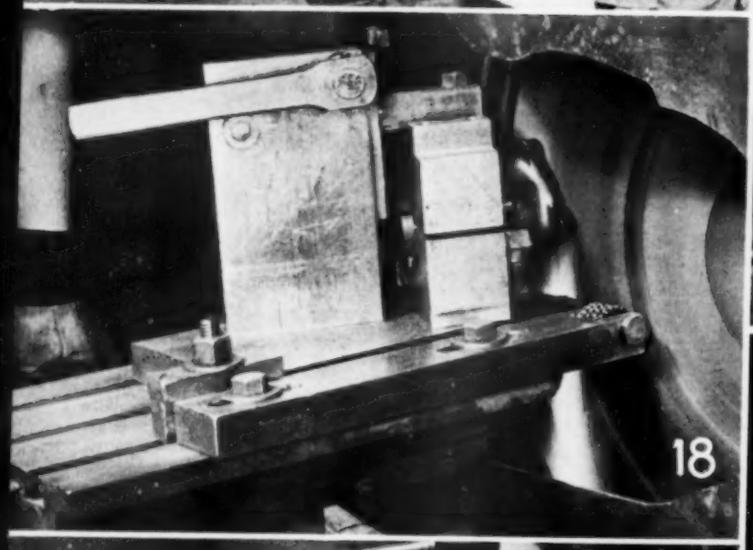


Fig. 17 — Abrasive wheel removing gates and risers

Fig. 18 — Grinding department smooths gate areas and removes surface irregularities

Fig. 19—Touching up inside surfaces with internal grinder

Fig. 20—After sand blasting, castings go to the inspection department

Fig. 21—All castings are sand blasted, some shot blasted as well

Fig. 22 — Checking casting surfaces by means of black light inspection

Fig. 23—Trays of castings are passed through this automatic 250-kv x-ray machine for final check on quality

Fig. 24—Operator studying x-ray negative for possible flaws in castings

mechanized, high-speed production line. Only jobs having sufficient quantities to justify establishment of a practical production procedure are put on this line.

The company's precision casting facilities are housed in a new, modern building, with equipment and departments arranged so that quantity production flows in a straight line. The usual number of problems that might be expected to arise in setting up a new production process were encountered in the early days when operations were confined to making the turbo-supercharger bucket. In fact, for a time the daily shipments could be carried out in a man's hand, but one by one these problems were overcome as correct techniques were developed and personnel was trained to the new work.

Accompanying illustrations trace the major steps in making a precision casting from the customer's blueprint. Initially, a master pattern is fabricated from the prints, the material employed being brass, steel, Haynes Stellite alloy, wood or other material, depending on the design of the part. This master pattern is a replica of the piece to be produced but is slightly oversize to allow for wax and metal shrinkage. In ordinary foundry practice the pattern would be used to form the mold cavity into which metal would be poured, but for precision castings two additional steps are necessary before a usable pattern becomes available.

First, injection dies are prepared of a suitable soft metal from the master pattern. These dies, used to produce the expendable wax pattern, are a negative of the master pattern—cavities in the dies are a duplicate of the master pattern. For extremely simple shapes, dies can be machined from aluminum or other suitable metal and preparation of the master pattern can be eliminated.

Prefer Multiple Cavity Dies

The first step in die making is to imbed the master pattern in plaster in order to make the top half of the die. After one half of the die has been completed the plaster is removed and the second half is poured. Pattern cavities are reproduced in the die in multiples of as many as 20 for smaller castings in order to obtain the maximum number of patterns from each wax injection. Castings that have recesses or other sections, which would prevent the wax pattern from being withdrawn, make it necessary to form the die with removable inserts similar to the pattern assemblies used in sand casting practice. If the castings are extremely small a runner may be tooled into the die to connect with the multiple pattern cavities.

At the wax injection stations the die faces are first sprayed with a lubricant to prevent the wax from sticking. Cores, if necessary, are inserted; the die then is closed and clamped in an air-operated vise, and wax is injected into it from a "gun" similar to the automotive grease gun. Pressure is applied by a foot-controlled pneumatic ram, as shown in Fig. 4. The wax used is carefully blended from the raw materials and molded into blocks which later are remelted as needed at the injection stations. Wax compositions vary somewhat according to the size and shape of the patterns, a stiffer material being required in certain instances than in others.

Since the wax has a low melting point—about 140 F—the pattern solidifies in less than 30 seconds and can be removed from the die (Fig. 5). Operators usually work on two sets of dies alternately, preparing and injecting one while the wax in the other is setting.

After the die is opened and the pattern removed, the wax gate is broken off by hand and the pattern is placed on a conveyor belt to travel past inspectors and assemblers. The latter attach gates and risers by "wax welding" and mount the patterns on a wax gate molded especially for the purpose. Blind risers are commonly employed on patterns such as those shown in Fig. 6. In this particular case the correct size and location of the risers were arrived at after considerable experimentation, but they are not what one would expect to employ if the selection were based on sand casting experience—which is another indication of some of the problems inherent in precision casting practice.

Fig. 7 shows two patterns being mounted on a main gate, the final assembly operation prior to molding. The assembled patterns and gate travel by conveyor belt to a dipping station where the assembly receives a coating of fine silica, as shown in Fig. 8. Presence of this fine material next to the wax is responsible for the smooth finish of the resulting casting because, when the wax later is melted out, this is the surface on the inside of the mold which will be adjacent to the molten metal. After being dipped into the silica solution, the pouring end of the wax assembly is mounted on a square steel base, corresponding to a bottom board, and the area not coated by the dipping process is sprayed with silica. Somewhat coarser grains then are screened or "stuccoed" to the dip coating.

Next step is to dry the coated assembly. This is accomplished in a dehumidifying tunnel, the entrance to which is shown in Fig. 10. A conveyor belt travels through the tunnel, and the drying process is completed in 22 minutes.

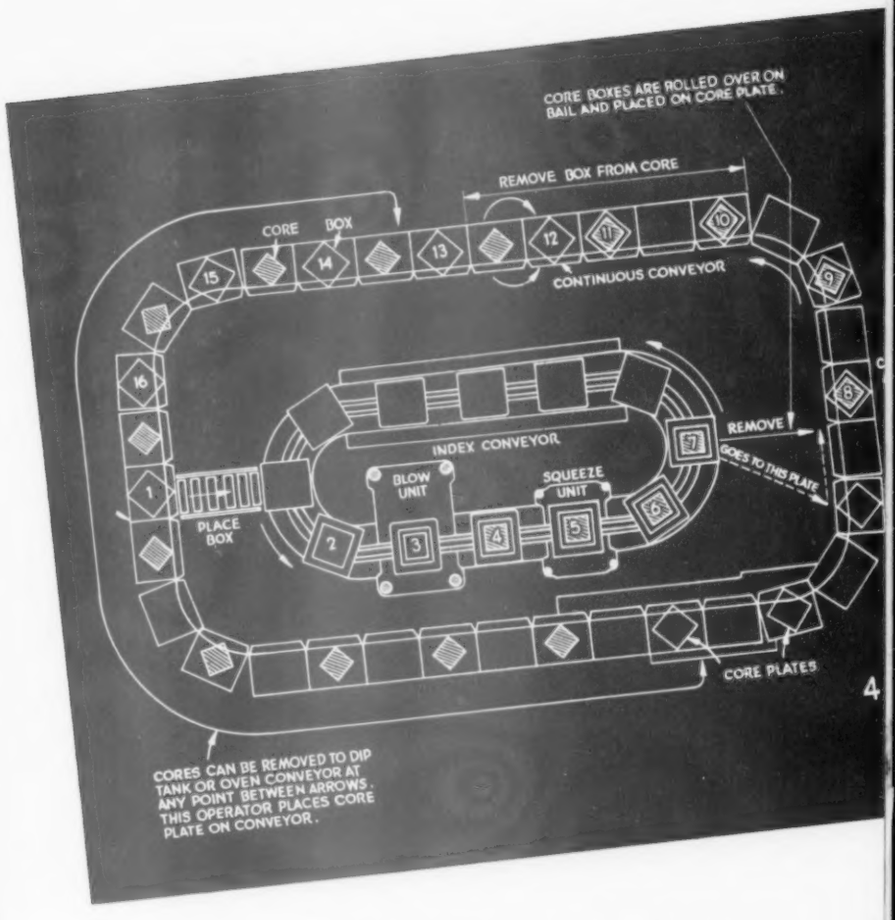
When the wax assembly emerges from the dehumidifying tunnel, a cylindrical flask is placed over it and sealed to the steel base plate with wax to make sure that it is liquid tight. The flask, made of a nickel-base alloy having good physical and mechanical properties at high temperatures, is wrapped in a wax paper roll that is longer than the flask in order to hold surplus investment material. This projection later is cut off.

A hanger conveyor carries the flask and contained wax patterns to the next department, where it is filled by hand with the investment material, as shown in Fig. 12. Components of the investment material, which is a combination of silica sand, silica flour, (*Please turn to page* 232)

Blowing Cylinder

Man-hour output in producing 65-lb cylinder barrel cores has been more than tripled by Buick Motor Division by use of automatic blowing and handling equipment. The setup is the first of its kind ever developed

By ARTHUR H. ALLEN
Detroit Editor
THE FOUNDRY


CORE BOXES ARE ROLLED OVER ON BAIL AND PLACED ON CORE PLATE.
REMOVE BOX FROM CORE
CORE BOX
CONTINUOUS CONVEYOR
INDEX CONVEYOR
BLOW UNIT
SQUEEZE UNIT
PLACE BOX
REMOVE
GOES TO THIS PLATE
CORE PLATES
CORES CAN BE REMOVED TO DIP TANK OR OVEN CONVEYOR AT ANY POINT BETWEEN ARROWS. THIS OPERATOR PLACES CORE PLATE ON CONVEYOR.
4

Figs. 1 and 2—Views taken from opposite sides of blown cylinder barrel core

Fig. 3—Showing operators placing rolled box frame squeezer onto core plate, assembling vent plate and fifth piece, and stripping balance of corebox

Fig. 4—Plan view of coreblowing layout, to scale, showing arrangement of two conveyor systems with respect to blowing and squeezing units. Arrows indicate direction of travel

r Barrel Cores

WITH the goal of lowering unit costs of making cylinder barrel cores, improving the quality and uniformity of such cores, reducing manual effort involved by elimination of hand ramming, stepping up per-man productivity and, incidentally, per-man earnings, foundry engineers at the Buick Motor Division, Flint, Mich., five years ago began to explore the possibilities of developing automatic coreblowing equipment.

After extensive tests to refine and adapt the mechanism, a special unit was designed and installed for production of crankcase barrel cores for Buick 40 and 60 series, 8-cylinder engines. It was operated successfully until automotive production was interrupted by the war in January, 1942. However, last year when Buick undertook the supply of cylinder blocks for Hercules engines the coreblowing unit was again placed in production. With the resumption of automotive production both Buick and Olds crankcase cores have been produced in quantities on these units.

Cores for these power plants are double units, that is, two barrels per unit, four cores per engine for an 8-cylinder engine and three for a 6-cylinder. They weigh around 65 lb each, and formerly were produced by conventional hand ramming methods at a rate of about 28 per hour per three men. Automatic blowing equipment has a designed capacity of 2160 per 8 hours, with a crew of nine men. This figures to approximately a 221 per cent improvement in man-hour output. Equipment currently is being operated at a rate of about 225 cores per hour, somewhat below the ultimate capacity.

Description of the equipment, the first of its kind ever developed, is clarified by reference to the accompanying plan layout. Heart of the installation is of course the blow unit, which is a conventional type of coreblowing machine of sufficient size and incorporating special features to handle the boxes for the job. Adjacent to it is an air-operated squeeze unit, the function of which will be described later.

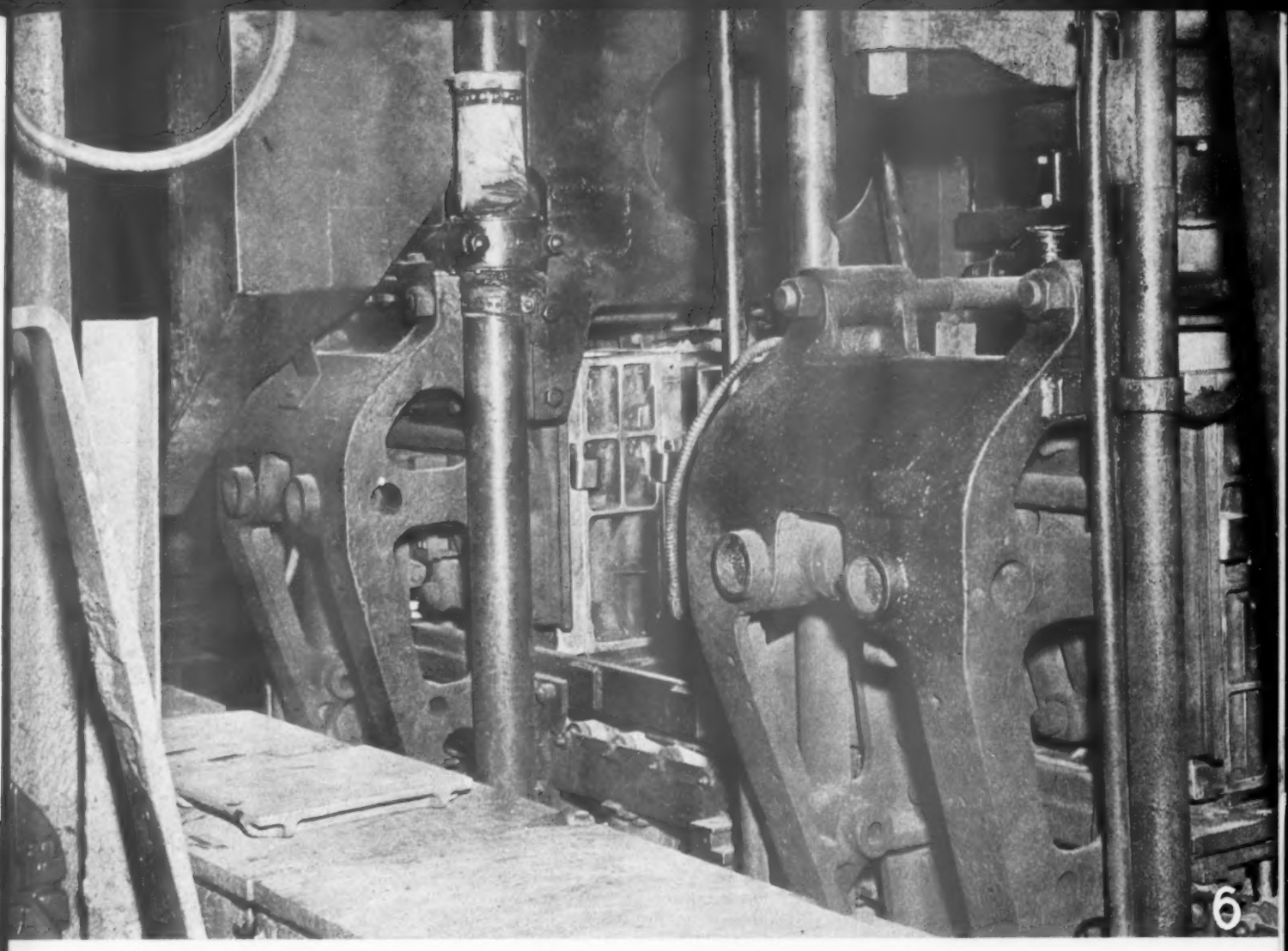
Feeding through these two units and indexing with them is a closed conveyor loop about 26 in. off the floor, carrying 12 flat steel plates, spaced in 30-in. centers, and each with four ¾-in. locating pins for accurately spotting the core boxes. The conveyor travels in a counterclockwise direction and is indexed by air on approximately a 12-sec cycle which is controlled by the outside stripping conveyor.

Outside this conveyor and surrounding it is a second continuous conveyor at the same level and traveling in the same direction, which is in effect a moving core-drawing bench carrying 34 flat plates, one adjacent to the other on 21-in. centers, the plates measuring 18 x 21-in. This conveyor is arranged so that every other station receives a box as it emerges from the squeezer unit and is rolled over onto a core plate positioned on the conveyor plate. As the conveyor moves around in a counterclockwise direction, the filled coreboxes are stripped and empty boxes reassembled on alternate stations for subsequent entry to the inner loop across a tie-in roller conveyor at the left end of the installation. A glance at the layout quickly shows how this alternate arrangement works, finished cores being removed at the front or lower side of the sketch. The extra stations on the outer conveyor simply provide sufficient "storage" space, so that men disassembling boxes, removing cores and reassembling boxes can keep up with the speed of the blow unit. Outside dimensions of the outer conveyor are 13 ft 9 in. x 23 ft 2 in.

The sequence of operation is roughly as follows: An operator rolls an empty box off the outer conveyor, sets the arbor pipes and spots it onto the index conveyor over the locating pins. The conveyor indexes twice to bring the box under the blow unit. The box automatically trips a master valve actuating the blow cycle, so that an empty plate can pass through the blow unit and the cycle will not function. The core is blown through the crankcase print and the blow plate is arranged to fill the deepest portions of the box first. This is governed by the size, disposition and angles of holes in the blow plate, which must be worked out carefully for each specific type of core. Elapsed time for filling the corebox is on the order of 0.1-sec.

Blow unit is of the sliding head type, with a measured quantity of sand deposited from an overhead hopper into the head, which then indexes on a cross slide over the positioned corebox. The latter is automatically raised under pressure to make firm contact with the head, the sand blown into the box, the fixture lowered and indexed on two stations to the squeeze unit.

Here it might be mentioned that early experiments in the blowing of barrel cores presented considerable difficulty in bringing sufficient pressure behind the blown sand to make a compact core which would not break upon be-



ing drawn, or sag after baking. Repeated experiments brought sag down to a fraction of an inch, but this was still not satisfactory. Just when it appeared the problem was incapable of solution, the usual inspiration came along. The idea was to use a so-called upset frame incorporated in the blowhead, in the form of a cavity about 1½ in. deep, with tapered sides matching the top of the corebox, so that after blowing, a 1½-in. so-called "upset" of sand is formed on top of the core. This excess material is then squeezed down flush with the top of the box in the squeeze unit, which is simply a ram powered by a large-diameter air cylinder, inside of a frame enclosing the upset sand and having sufficient force to compact the upset portion of sand. This final squeeze proved to be the margin between cores that sagged after dipping and baking and cores which retained their original shape.

Fig. 5—Showing continuous outside conveyor with corebox assemblies and finished cores, and a box being placed on the inside index conveyor for blowing. Cores are carried forward to dip tanks and core oven

Fig. 6—Coreboxes indexed into position in core blower (left) and squeezer (right). Sand upset can be seen at top of box (extreme right)

Since the core is blown through the crankcase print, the effect of this final squeeze is concentrated there and not in the barrel sections. One estimate is that the "supercompacting" may extend to a depth of 5½ in., but it also is possible that a partial effect could travel all the way through to the ends of the barrels. At least it eliminates any sagging, a defect which usually is observable at the barrel ends.

To return to the operational sequence, after the corebox emerges from the squeeze unit, it indexes two stations to the right side of the conveyor loop, where an operator lifts the box off the plate with a bail, rolls it over and deposits it on a core plate positioned on one of the outer conveyor stations. At this point an operator standing outside the conveyor draws the vent plate and removes the fifth piece. As the box rounds the corner and goes into the "back stretch," four men at draw stations, two inside and two outside the conveyor, strip the box from the core and reassemble it around the fifth piece and vent plate on the station immediately following.

Passing beyond the draw stations, cores may be removed to dip tanks or an oven conveyor at any point until coming around to the front side where core plates are replaced on alternate stations to receive boxes as they are lifted off the inner conveyor.

From this description, it may be seen a minimum of manual effort is involved on the part of the nine or ten man crew. Assembly of the five-piece aluminum boxes is a relatively simple procedure; (*Please turn to page* 288)

By JOHN HOWE HALL
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Converter Process in Steel Foundries

Operating conditions with different types of converters are discussed in this conclusion of a three-part article on the converter process

THE methods used in making final additions to the steel were somewhat different in bottom and side blown converter processes. The bottom-blown converter with which the present author worked was set high enough from the ground to permit the ladle to be brought into position to receive the steel from the converter, with only a shallow depression in the way of a pit. Side-blown converters, on the other hand, are usually set at a lower level, to facilitate filling them from a cupola ladle handled by the foundry crane, and a rather deep pit is placed in front of the vessel to allow the steel ladle to be lowered enough to be filled from the converter. Therefore, it was difficult to add alloys directly into the bottom-blown vessel, whereas the side-blown converter stood at a convenient height with its open nose sloped upward, making it easy to throw in lumps of ferrosilicon or ferromanganese, or to pour in melted cupola metal from a small ladle.

For another thing, when the bottom-blown vessel was turned down, the metal just came to the nose in front, and cleared the lowest row of tuyeres by only a few inches. To stir up the metal too vigorously tended to throw some of it out of the nose, or to splash steel into the tuyeres, which was likely to plug up some of the holes. Obviously, too, it was not possible to rock the vessel up and down to mix the additions into the metal.

Methods of Adding Ferroalloys Were Different

For these reasons, standard practice with the bottom-blown converter was to use final additions of ferromanganese and ferrosilicon, or of silico-manganese, which were premelted in a baby cupola—or sometimes in crucibles—with sufficient low-phosphorus pig iron to bring the carbon to the desired point. The steel ladle was placed on a platform scale at the baby cupola and the correct amount of molten alloy was tapped into it. The crane then carried the ladle over to the converter, and the blown metal was poured in on top of the recarburizers, the desired amount of aluminum being tossed into the stream running from the converter. The stream of metal from the vessel was large enough to give a vigorous stirring action in the ladle, and no trouble from uneven composition was encountered.

In side-blown operations, the ferromanganese and ferrosilicon were ordinarily added solid, though in some shops they were used premelted and handled in a small ladle. The lumps of solid alloy were dipped in water and thrown into the converter hard enough to hit the molten bath well back from the nose of the vessel. The moisture produced a minor explosion when the lumps of alloy struck the slag, thus blowing a hole in the slag and preventing it from trapping the lumps before they could reach the metal. The necessary amount of molten pig iron, in the form of metal from the main cupola, was measured in a small ladle and poured into the converter, commonly after the addition of ferrosilicon (usually 10 per cent grade) and 80 per cent ferromanganese. A small part of the silicon was sometimes added as 50 per cent alloy, and shoveled into the stream running from the vessel. When premelted alloys (*Please turn to page* 316)

Who discovered Black Heart Malleable?

Black heart malleable iron commonly is assigned 1826 as the year of its origin. The possibility that certain weapons, made of black heart malleable and found in Minnesota in 1871, are of Norse origin suggests that this form of iron may have existed as much as 600 years ago

By DR. HARRY A. SCHWARTZ
Manager of Research
National Malleable & Steel Castings Co.
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QUITE commonly, black heart malleable has been thought to have a definitely assignable birthday. Speaking of his experiments, Boyden on July 4, 1826, wrote in his diary that he had made a piece, dark in color and tougher than any he had yet seen.

Certain recently discovered facts suggest at least a possibility that the material may have been made centuries before. To tell the tale properly it is necessary to turn to some little known aspects of pre-Columbian American history.

We have all been taught that Lief Erickson was the first European to land in America at some point near the New England coast. What we ordinarily have not been told is that he came not directly from Norway but from a Norse settlement on the west coast of Greenland, and that his was not a mere casual visit but that the colonies maintained contact with "Vinland" for centuries.

It is recorded in Scandinavian archives that the colonies in Greenland maintained themselves for centuries but that in 1342 word reached Norway that one of these colonies, abandoning civilization and the Christian religion, had become amalgamated with native tribes to the west. Magnus Erickson, then king of Norway and Sweden, and a notable religious zealot, dispatched an expedition under one Paul Knutson to seek the apostates and compel their return to the true faith.

Norsemen Reached Northern Minnesota

The expedition, after some preliminary wanderings, penetrated Hudson bay, the Nelson river and reached northern Minnesota via Lake Nipigon. In 1362 a large group of their party was annihilated by Indians near present Kensington, Minn. How all this story was reconstructed and traces of the expedition's route unearthed, is told by Hjalmar Holand in *Westward from Vinland* published by Duell, Sloane, and Pearce in 1940. Holand, who has devoted a lifetime to antiquarian research pertinent to the Norse penetration of North America, also shows a great array of pictures of medieval Norse weapons found at various places in Ontario, Minnesota, Michigan and Wisconsin.

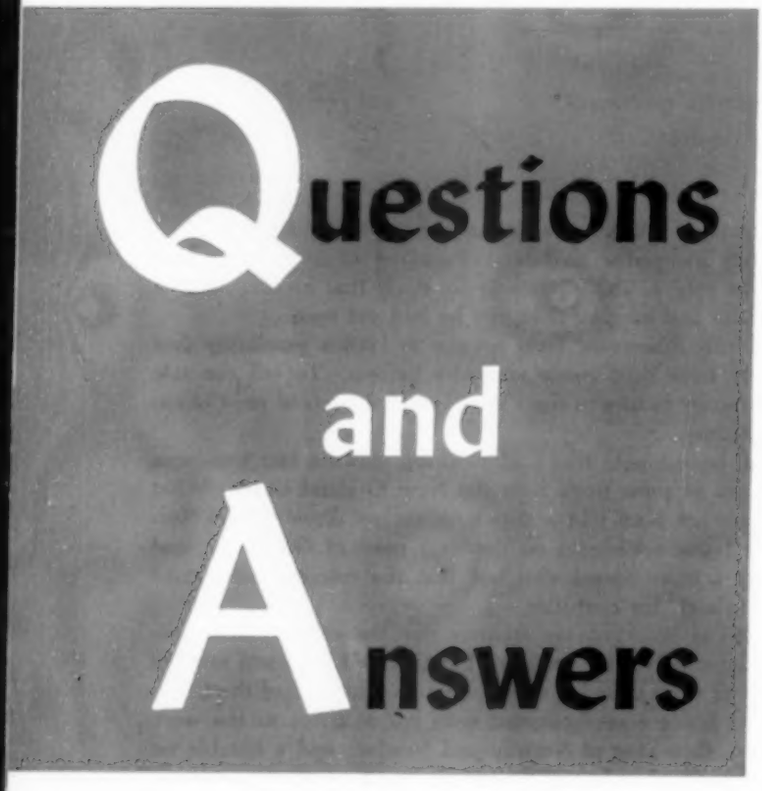
Among finds not described in his book were three halberds—long-handled pointed weapons used in the 15th and 16th centuries—concerning whose discovery he has written the author as follows:

"The implement which I sent you was found in 1871 by E. O. Estenson, who is still living in Crookston, Minn. He was then a small boy and found it while bathing in Red river, a few miles northwest of the present village of Climax, Minn. It was in the same battered condition in which it is now. His father was a member of the first company of white men who settled in Polk county. (*Please turn to page* 302)

Lining Reduces Melting Rate

Q.—Recently we relined our cupola to 32 in., inside diameter. The fan is a 10 in., old type running at 2900 rpm. Under former conditions the cupola operated satisfactorily and melted at the rate of 3½ tons per hour. Since relining we have been unable to get more than 3 tons per hour. We have slagging trouble all through the heat and the cupola is completely bridged before the heat is finished. The daubing material is a mixture of silica grits and fire clay. Double the usual quantity of limestone apparently has no effect and we are using more coke.

A.—The problem has all the earmarks of a common condition in many foundries, and that is lack of observation.



Under former conditions when the cupola was working satisfactorily the old lining probably had burned back 2, 3 or 4 in. to give a diameter of 36 to 40 in. in the melting zone and a production of 3½ tons per hour. The new lining set definitely to 32 in., diameter naturally cuts down the melting area and the consequent production. For the same reason you probably are using the same weight of iron and coke charges. These were satisfactory in a —presumably—36 in. cupola, but they are too large for the 32 in.

Melting iron in a cupola means the maintenance of a nice balance in the proper time required to burn a definite quantity of coke at maximum temperature immediately under the iron as it passes through the melting zone. If this balance is broken by large charges of coke or iron which travel downward too slowly, the excess air unconsumed and rushing upward acts as a cooling agent instead of a heat expediter. A homely illustration is the experiment of blowing the breath on a candle flame. A mild jet of air causes the flame to accelerate. A more severe blast extinguishes the flame. Suggested change in practice is to start with a high coke bed, say 40 in. above the tuyeres, then charge alternate layers of 500 lb iron and 60 lb of coke, with a shovelful or 20 lb limestone on each charge. This is minimum. Gradually for a few days the amounts may be increased or adjusted until cold iron, or a bridge over the tuyeres indicates the upper limit has been passed. Apparently your blower has sufficient or even excess capacity. The proper volume can be secured by adjusting the gate in the blast pipe or by regulating the motor and fan.

Casting Method Is Different

Q.—What is the best metal for making a permanent mold? Is ordinary gray iron satisfactory? What is the proper temperature for pouring aluminum into a permanent mold? Does the metal have to be poured under pressure?

A.—Up to the present, so far as we know, no book has been written or published on the subject of permanent molds. However, the subject has been covered extensively in THE FOUNDRY and other technical publications.

A popular impression prevails that die casting and permanent molds casting are synonymous terms, that they mean the same thing. They are not and do not. The mistake probably is due (a) to the fact that in both instances metal instead of sand molds are employed, and (b) to notoriously loose foundry nomenclature. Where metal is poured under pressure the process is known as die casting.

Details vary to a considerable extent from ordinary permanent mold casting where the metal is poured merely by gravity into metal molds. Several books are available on the subject of die casting, for example *Die Casting Practice*, by Stern; *Die Castings*, by Chase and *Die Casting* by Herb. An unusually complete article on permanent mold casting technique by John Vickers was presented in THE FOUNDRY February, and March, 1945.

Special process or other high grade gray iron is favored by makers and users of permanent molds. Temperature of aluminum as poured into permanent molds will depend on the shape, size, and thickness of the casting. The same general rules apply as in pouring metal into sand molds, with the exception that in the majority of instances the metal is poured into a permanent mold at a temperature 50 degrees higher than metal for a similar casting poured in a sand mold.

Castings Show Rough Surface

Q.—Wrinkles and sand cracks appear on the cope and drag side of plain matchplates and other castings with plain, flat surface. Recently when we used facing, this form of defect did not appear. However, we want to use just heap sand. We have no sand control or testing equipment and must guess at the permeability and moisture content.

A.—From your description it would appear that all the sand needs is a little more *strength*. When you use facing sand, presumably either all new or nearly all new sand, you have no trouble. Therefore, it would seem that the simplest solution to your problem is to continue using additions of new sand. Grain fineness, permeability and green strength are of primary importance in connection with molding sand. Pouring temperatures on aluminum alloys are low, and therefore, refractoriness is not a main factor.

The clay bond must maintain its properties through repeated usage with a minimum addition of new sand. With repeated use there is a tendency for the grains to break down and consequent development of a considerable amount of fines or silt. This material has no particular bonding value, and does destroy permeability and strength. A suitable sand for your purpose will have a clay content between 15 and 20 per cent, permeability not less than 10 according to A.F.A. standard methods for fine castings and not less than 15 for heavy castings. Green strength should be not less than 5 lb.

There is not much point in setting down these figures since you have no sand testing equipment. Under present conditions it may be sufficient to say that the sand covering large flat surfaces is exposed to more severe service than sand in the remainder of the mold and therefore, in the ordinary foundry term should be *stronger*. The heat from the metal causes the large areas to expand and crack here and there. The metal enters these cracks and forms the irregular ridges that give the face of the casting such a rough appearance. The necessary green sand to withstand this expansion without cracking can be developed and maintained by additions of new sand, clay or any of the gum or cereal binders. Usual precaution of course must be observed in preparing and ramming the sand.

Make Molds by Electro-forming

Q.—We are interested in obtaining some information on electro-forming of molds.

A.—Electro-forming is a procedure involving electrodeposition of the desired metal or alloy upon a suitable pattern or model. The idea is not new although certain developments have advanced the application. Duplicate patterns for castings have been made by electro-forming for years, and the method is said to possess certain advantages.

Procedure is to use a single shrink pattern which is covered with a thin coat of grease, oil-soap or other parting mixture, and then covered with a liquid mixture of plaster of paris. After the plaster mixture air sets or becomes hard, the pattern is removed and the plaster mold is dried in an oven at about 140 F. Mold is waxed while still warm, and then allowed to cool. The mold is made conductive by coating with graphite or metal powder, wires attached, and the mold immersed in a copper plating bath. Plating is done in a still tank and a minimum copper coat of 1/32-in. applied at those points where the throwing power of the bath is lowest—which means that at other points the coating may be much thicker.

Since the shell pattern formed is too fragile to withstand service in production of castings, it is tinned on the interior surface and filled with white metal composed mainly of lead with some tin and copper, and 20 per cent antimony. That gives a solid pattern which is said to compare favorably in weight with solid brass or iron patterns.

Several years ago one of the rubber companies developed a procedure employing somewhat the same principles described except that the plating bath is an iron solution for the manufacture of intricately patterned molds for tire production. The iron shell formed in the process is considerably thicker—in the vicinity of ½-in.—and like that for the pattern is backed with cast iron or other metal to provide the necessary stiffness for commercial use.

Losses in Nonferrous Melting

Q.—Can you tell us what would be the melting losses per 100 lb on an alloy containing 1.50 to 5.50 per cent Sn, 2.50 to 8.00 per cent Pb, 3.00 to 6.00 per cent Zn—these items to be added to copper to make up a heat? Melting temperature ranges from 1800 to 2300 F.

A.—Since metal loss in melting by volatilization and oxidation depends upon furnace practice, the only definite method to ascertain it properly is to melt a number of heats of an alloy whose exact composition is known previous to melting. Analyses of the alloys after pouring will indicate the losses, and how much of the various metals will be required to bring them back to composition. As a general rule the greatest loss is in zinc content, since that element boils or volatilizes at the comparatively low temperature of 1667 F or several hundred degrees below the usual melting temperature employed for brasses. Boiling point of tin is about 4100 F while that of lead is around 2948 F so that any losses of those metals will be by oxidation, and with ordinary care in melting practice they should be comparatively low.

In most cases an allowance of 1 to 2 per cent is made in zinc content to take care of the loss—that is to say the material as charged can contain 1 to 2 per cent more zinc than that finally desired, or it may be added a short time before the pot is pulled from the furnace. The specification you give should not be hard to meet since you have plenty of latitude in the various elements; considerably more so than is the usual case. If you are aiming to hold the tin to the low side and the lead and zinc on the high side, we suggest ingot containing 2 per cent Sn, 8 per cent Pb, 7 per cent Zn, remainder Cu.

GANGWAY! By J. A. Patterson

'Yes'm it's of you alright—but I never said you posed for it, mam—I done it from memory."

Describes Procedure For Plaster Molding

Q.—In a recent issue containing the article "Brass and Bronze Foundries Make Metallurgical Advances," by A. H. Hesse, one of the illustrations shows cores being added to baked plaster molds for the production of small bronze castings. We are wondering if it is possible to secure detailed instructions on making such molds as we are faced with the production of a goodly quantity of small bronze castings in which precision of casting is important.

A.—Plaster molding is not too difficult, but like any other molding method some experience has to be gained before the work functions properly. Close attention to details is required, and considerable care must be exercised in performing the various steps where accurate control of dimensions is involved. First point requiring attention is the making of the patterns, and those will have to be made with the correct shrinkage for the particular bronze alloy and also for the casting plaster. Data on the latter may be obtained for various types from the manufacturers.

Patterns usually are made of brass when production work is involved. Aluminum is not quite so satisfactory as it is claimed that the surface is somewhat porous, and since plaster reproduces every detail, surface discontinuities of the pattern appear on the casting. Plaster composition is a mixture of plaster of paris or gypsum cement, fibrous talc and water. The cement and talc may be purchased separately and mixed in the proper proportions, or purcased already mixed. Usual ratio is 4 lb cement or plaster and 1 lb fibrous talc. Those materials are mixed dry for 8 to 10 minutes in a mechanical mixer previous to the addition of water. Plaster is always sprinkled into water in the proportion of 1.7 lb water to 1 lb of the dry mix.

The mixture of plaster and water is stirred by a mechanical mixer for a definite time depending upon the purity of the water, its temperature, and the speed of the mixer, and is determined by experiment. Usual consistency of the mixture is that of thick cream. As might be expected no more plaster is mixed than can be used at one time since it will begin to harden shortly after the creamy consistency is reached. Liquid plaster is poured into the flask surrounding the pattern preferably from one side so that bubbles are not trapped in the liquid or on the pattern face. Vibration of the pattern or use of a stiff brush on the pattern face will aid in removing of any bubbles.

Wet mix is allowed to stand from 15 to 30 minutes to air set. Then the flask is removed and the mold placed in a heated oven to dry. Temperature may range from 600 to 1300 F, and the time of drying from 8 to 10 hr for the lower temperature to 2½ hr for the high. Molds are allowed to cool to about 300 F before removing from the oven, and the molten metal poured in while the molds are still warm since they tend to reabsorb moisture when allowed to cool to room temperature.

For greater detail on the various operations we suggest that you study "Casting in Plaster Molds," by Fred Chambers, which appeared in the March, 1944 issue of THE FOUNDRY, and "Precision Casting by the Investment Molding Process," by R. Neiman in *Transactions* of the AFA. Vol. 52, 1944. Information also may be secured from producers of gypsum cement whose names and addresses may be found in the advertising pages of THE FOUNDRY.

Articles Give Data on Centrifugal Casting

Q.—We are interested in setting up centrifugal casting equipment in one of our plants and now are collecting all data available in literature on the subject.

A.—A number of articles covering various phases of centrifugal casting has appeared in previous issues of THE FOUNDRY. One article giving considerable detail relating to nonferrous practice was published in the October, 1942, issue under the heading, "Producing Nonferrous Castings Centrifugally." A series of articles relating to steel foundry centrifugal casting practice includes the following: "Casts Steel Centrifugally," April, 1943; "Centrifuging After the Mold Is Filled," May, 1943; "Steel Sheaves Are Cast Centrifugally," June, 1943; and "Pours Steel in Cores Spun Vertically," July, 1943. Other articles include: "Ford Casts Cylinder Barrels Centrifugally," August, 1943; "Hydraulic Drive Spins Steel Casting Machines," November, 1943, and "It Can Be Cast Centrifugally," August, 1944.

Different Procedures Covered by Terms

Q.—What books or other literature have you on the subject of *centrifugal precision* casting, particularly with reference to process or methods, machinery, and if possible, type of firms using products made by this method?

A.—From your inquiry we gather the impression that you think centrifugal and precision casting are synonymous terms, that they mean the same thing. They do not. In some instances precision castings are made by the centrifugal process, but that is only incidental. The term precision casting refers to a process where the mold is a special refractory block from which the wax pattern has been removed by melting. Centrifugal force may or may not be applied during the casting process.

Centrifugal casting is the term applied to a method where metal is poured into a rapidly revolving mold of metal, sand or refractory. Centrifugal force throws the molten metal against the wall of the mold and produces a hollow casting without use of a core. Up to the present precision casting has been confined to small objects. Castings made by the centrifugal process vary from a fraction of a pound to several tons. During the past few years THE FOUNDRY and other technical magazines have published a long list of articles on both methods. The American Foundrymen's Association, 222 West Adams Street, Chicago, has compiled in booklet form a symposium of the papers presented on centrifugal casting at the Buffalo convention two years ago.

Manufacturers using precision castings are those engaged in the production of any kind of devices containing large numbers of small duplicate parts. The process produces castings minutely accurate in dimensions and eliminates costly machine work.

Sand Control Requires Numerous Tests

Q.—We read recently with much interest Ralph L. Lee's reference to testing sand, and since we just are completing the installation of sand handling equipment in our foundry, we would like some information on the simplest way of testing the sand before it is deposited in the molders' hoppers. We intend to install some type of testing device and would like to know more about what to use.

A.—Unfortunately, there is no single testing device which will enable you to determine all the properties of molding sand. For example, grain size and distribution are determined by use of a standard set of sieves; permeability is determined by the rate of flow of air through a sand specimen of definite size and density, and likewise moisture content, clay content, green and dry strength require different testing equipment. Hence, we suggest that you obtain a copy of the fifth edition of *Foundry Sand Testing Handbook* which describes all sand testing methods advocated by the American Foundrymen's Association, and the instruments used for the tests.

Also, since you operate a nonferrous foundry, you will be interested in obtaining a copy of *Recommended Practices for the Sand Casting of Nonferrous Alloys* which gives information on the characteristic properties such as fineness, perme-

(*Concluded on page* 180)

When at the FOUNDRY SHOW — *Cleveland, Ohio*

MAY 6—10th, 1946

It will pay you to visit our exhibit where you will see many examples of the advantages that Nickel offers the producer and user of foundry products. Our display occupies the stage and its frontal area on the main floor of the Auditorium. An adjacent conference room will be available where you can discuss your problems with our metallurgists and foundry specialists.

THE INTERNATIONAL NICKEL COMPANY, INCORPORATED • 67 Wall Street, New York 5, N. Y.

(*Concluded from page* 178)

ability, clay content, moisture, etc. of molding sand suitable for various nonferrous alloys. Also, you might write to the various manufacturers and suppliers of sand testing equipment whose names and addresses may be found in the advertising section of THE FOUNDRY.

Probably the best procedure in your case would be to take the various molding sands which have been used successfully, and determine such properties as clay content, permeability, green strength, grain fineness, etc., and use those as standards until such time as you are familiar with testing procedures, results obtained, etc. From such bases you then can make changes in sand characteristics to meet desired conditions.

Small Iron Cap Casting Shows Defects

Q.—We are forwarding several small bearing cap castings and a gland casting with a flat flange on top 6 in., diameter, and will appreciate your opinion on the cause of the defects, which developed only recently. We have been making similar castings for over a year without any trouble. On account of the scarcity of scrap we use nearly all pig iron in the cupola charge.

A.—Composition of the iron and melting practice are not factors in the present instance. The iron does not lie quietly in the mold. It is impregnated with steam. In the thin cap castings the steam forms a mass of small bubbles that are held when the iron solidifies. In the comparatively heavy gland the steam occupies a certain amount of space during the solidifying period and concentrates in the vicinity of the gate. In the final shrinkage of the casting this space is filled with steam instead of hot, liquid metal and naturally interferes with the entrance of feeding metal. The result is a cavity at the heavy juction of flange and upright part of the casting. The core should be vented.

The defective area on the cope side of one cap casting is caused by slag that floated in with the iron and came to rest against this part of the cope face of the mold. The remedy for this is obvious. The remedy for the other castings suggests several possibilities and is rather complicated by the statement that the castings have been made for a year without any trouble. It is practically certain that some change has been made in the sand or in the manner of handling it. An increase in the bonding material, the moisture content or the density of ramming may be responsible.

If the sand and molding practice formerly were just over the border line, a very small change would produce defective castings. Tight flasks and tight bottom boards prevent the free exit of steam. These castings are in a class where development of steam must be held to a minimum, and where maximum provision must be made for the amount of steam that inevitably is developed in the mold.

Rusty Chill May Cause Metal to Boil

Q.—We have trouble with a roll point casting, weight 60 lb. The lower, or pointed end of the casting, is formed in a chill. The castings appear satisfactory when shaken out, but when the surface is machined or ground, small gas bubbles appear and render the casting worthless. We have tried various remedies and changes in the style of gates including a horn gate through the bottom of the chill. After running off the gray iron part of the heat we place a double charge of coke in the cupola with 20 lb limestone and several cakes of a proprietary fluxing material and then add the special charge of steel and alloys. Total charge weighs 400 lb. The metal comes very hot and is poured into the mold through a gate at the joint line between the chill and the upper part of the mold. We shall appreciate your opinion on the probable cause and remedy for this condition.

A.—Since you already have tried all the methods which presumably would occur to an experienced foundryman, and since long distance diagnosing may go astray for lack of a description of all major and minor factors, we hesitate at offering a positive opinion. From the facts submitted, a chill mold and gas bubbles in the casting, it is apparent that the metal does not lie quietly in the chill. The composition of the metal is not a factor, and the style of gating is only of secondary importance.

The only really important feature is to provide a chill which does not develop gas or steam when filled with molten metal. As an experienced foundryman you would take suitable precaution against any deposit of dampness on the face of the chill, but a possibility exists that you overlook rust or scale even in minute quantity. The face of the chill should be scoured clean and then covered with a thin coating of facing material. Various suitable materials are available. In some instances a soot deposit from a smoking acetylene torch is employed. In another instance the face of the chill is covered with a thin coat of blackwash and then dried in the core oven over night. Under other conditions a thin coating of oil and plumbago is rubbed on with the fingers. Prominent foundry supply houses whose names and adresses appear in THE FOUNDRY have developed special washes for chills.

Give Core Sand Mixture And Other Data

Q.—Where can we obtain information on a good core sand mixture for antimony-lead castings weighing about 10 lb; a good core sand mixture for light aluminum work, and on use of strainer gates for matchplate work in brass or bronze castings?

A.—Main difficulty in cores for high lead content alloys is prevention of metal penetration which is due to the high specific gravity of lead. Penetration also is aggravated by excessive pouring temperature which prolongs the time in molten condition. Hence, since lead melts at 621 F, the temperature should never be any higher than will permit the castings to run without cold shuts, and preferably not over 800 F. We do not believe that the actual core mixture itself will have as much of a bearing on the suitability as the necessity of applying a good coating of graphite or other carbonaceaus material in oil which is rubbed in well to seal the surface of the core. After the coating is applied the core should be dried thoroughly. Coating material is made by adding dry graphite or blacking to core oil to form a paste.

You do not mention whether the cores for the aluminum castings are small or large, or whether they will be completely surrounded by metal such as jacket cores. The latter must possess high permeability as well as sufficient fragility to break down as the metal contracts during solidification. For small cores you might try a mixture of 50 parts bank sand, 50 parts silica sand, 1 part core oil and 1 part cereal binder; all parts by volume. For jacket cores use all silica sand 100 parts, 1 part core oil and 1 to 1½ parts cereal binder.

Your question relative to use of strainer cores or gates is not quite clear. If you want to know whether they are being used, the answer is yes. Many foundrymen have found that strainer gates give clean, sound castings where previously they had encountered some trouble. While the use of strainer gates is quite common in automotive gray iron foundries, it is not so prevalent in brass and bronze foundries. However, there is no reason why it cannot be applied just as successfully. Best method of ascertaining whether or not a strainer gate will be a worthwhile improvement is to try it out. You can make a small corebox of the proper shape with a number of pins or projections to form the holes. Size of the holes may vary, but for small castings we believe that you might try 3/16-in. diameter. To be effective the strainer gate should be placed as close to the casting cavity as possible.

BETTER SURE THAN SORRY

According to olden legend Icarus flew too near the sun, only to spin in when his wings failed to stand the stress at high temperature. Here was an early case of serious trouble due to misplaced confidence in materials.

There are applications for cast steel nowadays where creep strength (the ability of steel to keep working when the heat is on) makes a great difference. Molybdenum cast steels, being noted for their creep strength, are economical preventives of high temperature trouble.

Icarus had no accurate data on materials to guide him. A wealth of tested, practical facts about Molybdenum cast steels for elevated temperature service is available on request for today's engineers and designers.

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CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

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MOLY

MEN of Industry

DWIGHT ADAMS

DWIGHT ADAMS has been appointed head, Philadelphia office, Pittsburgh Steel Foundry Corp., Glassport, Pa., and will represent both the Pittsburgh Steel Foundry Corp. and the Fort Pitt Castings Division of that company. Mr. Adams was formerly with the Heppenstall Co., Pittsburgh, and was associated with its Philadelphia office for 11 years.

♦ ♦ ♦

ROBERT D. HAND

Robert D. Hand has been appointed to the staff of the National Founders Association, Chicago, where he will specialize in technical and job evaluation problems and assist Gottfrid Olson, well-known foundry engineer, in his work with the association. Mr. Hand, a graduate of Purdue University, recently served in the Army with the rank of major. **Alvin H. Berndt** has been appointed to the association staff to handle public relations work. Mr. Berndt was recently released by the Navy with the rank of lieutenant commander. A graduate of the University of Illinois and of the John Marshall Law School, he was engaged in promotion and development work, Youngstown Sheet & Tube Co., for six years prior to his Navy service. During 1941-1942 he was with the Iron and Steel Branch of the War Production Board, Washington.

C. C. Hermann has been appointed special representative of Whiting Corp., Harvey, Ill., for the sale of its line of dust collector and spark suppressor equipment in Indiana, Michigan, Ohio, western New York and eastern Pennsylvania, with headquarters in Grosse Pointe Park, Mich. Mr. Hermann has had many years of experience in the engineering and sale of dust collecting equipment. He was formerly general manager of the Claude B. Schneible Co., Detroit.

♦ ♦ ♦

Lars E. Ekholm has joined the metallurgical engineering staff of the Climax Molybdenum Co., New York, with headquarters in that city. Mr. Ekholm, a graduate of Lehigh University, has been metallurgical engineer for the Alan Wood Steel Co., Conshohocken, Pa., for the last seven years. Previous connections include: Metallurgist, Aluminum Co. of America; metallurgist and open hearth superintendent, Harrisburg Steel Corp., and metallurgist, Henry Disston & Sons Inc.

♦ ♦ ♦

P. D. Evangeliste, formerly assistant superintendent of the foundry, Elliott Co., Jeannette, Pa., has been appointed foundry superintendent, succeeding E. **Blansett,** who has retired. **R. R. Kuhn,** who was formerly a foundry foreman, has been made assistant foundry superintendent, to replace **H. Bach,** who has also been placed on pension.

♦ ♦ ♦

Harry F. Griscom has been appointed manager of the foundry division, the Wheland Co., Chattanooga, Tenn. Mr. Griscom, until recently, held a similar position with Tampa Shipbuilding Corp., Tampa, Fla., and prior to that was vice president in charge of sales, the Ross-Meehan Foundries, Chattanooga. **Carl L. Landgrebe** has been made superintend-

(*Continued on page* 184)

ALVIN H. BERNDT

C. C. HERMANN

LARS E. EKHOLM

WOODWARD IRON COMPANY

WOODWARD, ALABAMA

General Sales Offices

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(*Continued from page* 182)

ent of the foundry division. Mr. Landgrebe has been associated with the Rouge plant of the Ford Motor Co. in the experimental and production foundry since he was graduated from Cornell University. **C. C. Lay** has been appointed controller in the foundry and machinery divisions. Mr. Lay was formerly with the Marshall Stove Co., subsidiary of Sears-Roebuck, and previous to that was auditor of the Commonwealth Edison Co., whose staff he joined after working as senior accountant with Arthur Anderson & Co. **Charles S. Chisolm,** recently discharged from the Army with the rank of lieutenant colonel, has been made metallurgist of the foundry division. A graduate of Auburn University, he was formerly associated with the Tennessee Coal, Iron & Railroad Co.

♦ ♦ ♦

Lawrence E. Rayel has joined the sales force of the Werner G. Smith Co., Cleveland. Mr. Rayel spent 4½ years in the Army, from which he was discharged recently with the rank of first lieutenant in the field artillery. With the Werner G. Smith Co. he has been assigned to the same territory served by his father, **William E. Rayel.**

♦ ♦ ♦

Roger W. Griswold Jr. has been elected vice president of the Griswold Mfg. Co., Erie, Pa. A graduate of the Babson Institute of Business Administration, Mr. Griswold entered the shop and foundry of the company in 1939, and has been foundry superintendent since 1943. He is currently serving as the first chairman of the Northwestern Pennsylvania Chapter of the AFA. **Frank P. Volgstadt** has been appointed general foreman in charge of the foundry. Mr. Volgstadt joined the company ten years ago as an aluminum polisher, served an apprenticeship in molding and metal handling and subsequently became foreman of the aluminum foundry, foreman of the aluminum heat treating and gray iron side floor department, and assistant to the foundry superintendent. **Edgar J. Sierk,** until recently a supervisor at the Harrison Radiator Division of General Motors Corp., Lockport, N. Y., has been made foundry foreman. Mr. Sierk has spent 18 years in the foundry industry, 13 of

EDGAR J. SIERK

which were spent as a molder at Westinghouse Electric Mfg. Co., Attica, N. Y., a year with Doehler Die Casting Co., Batavia, N. Y., and four years with Harrison Radiator Co. in various capacities.

♦ ♦ ♦

Benjamin P. McDaniel has been named vice president in charge of client relations, Associated Engineers Inc., Fort Wayne, Ind. Mr. McDaniel was recently released from the Army with the rank of lieutenant colonel. Before entering the Army in 1942 he was supervisor of service for Pan American-Africa Airlines.

♦ ♦ ♦

R. G. Roshong has been appointed product manager of the new ingot division of Reynolds Metals Co., recently opened in Louisville. Mr. Roshong has been technical advisor for the aluminum division of the company in that city. **J. M. Stuart,** formerly supervisor of the metal control department of the company, at Listerhill, Ala., has been made assistant product manager. **T. D. Stay** is technical advisor for the new division. He was formerly associated with the National Transit Pump & Machine Co., Aluminum Castings Co., and Aluminum Co. of America. **P. C. Beck,** formerly associated with Aluminum Co. of America, and **J. E. Collins,** manager of the foundry at Springfield, Mass., operated by Reynolds for the government during the war, have been appointed field service engineers. **Owen L. Mitchell,** formerly a metallurgist for the company, has been made product supervisor of smelting methods and quality control, for the new division.

♦ ♦ ♦

Norman A. Matthews, formerly a lieutenant colonel in the U. S. Ordnance Department at the Watertown Arsenal, has been appointed works metallurgist of Electro-Alloys Division, American Brake Shoe Co., Elyria, O. Mr. Matthews, a graduate of Massachusetts Institute of Technology, was associated with the National Tube Co., and later the U. S. Steel Corp., before entering military service in 1940. Until recently he had been director of the ferrous metallurgical laboratory of the Ordnance Department.

♦ ♦ ♦

George Smith has returned to Conco Engineering Works, Mendota, Ill., after 2½ years' service as a lieutenant in the Navy. He has assumed the position of sales supervisor for cranes and hoists. Mr. Smith joined the company in 1935, and at the time of his entry into service was field engineer for the crane and hoist division.

♦ ♦ ♦

Clyde W. Blakeslee, who retired recently as general manager of N. A. Strand Co., Chicago, has resigned from his advisory capacity with the com-

(*Concluded on page* 188)

LAWRENCE E. RAYEL

ROGER W. GRISWOLD JR.

FRANK F. VOLGSTADT

BENJAMIN P. McDANIEL

MODERN HANDLING METHODS

There's no time to lose in getting operating costs on a competitive unit-cost basis. Modern methods of handling are now a *must.* Electric industrial trucks, for example! Palletized loads! And, of course, the newest development in motive power Storage Batteries . . . the sensational Philco "Thirty" that gives 30% longer life! Try Philco "Thirty" in your hardest-working trucks. The tougher the job the better it shows up. Write for the facts today.

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TO IMPROVE *FINAL* FINISHING

To *LOOK* its best and to *SERVE* best the finish applied to a product must be of perfect quality.

With some products the slightest imperfection detracts from the "band-box" appearance that is so necessary for sales appeal and lasting beauty. In other cases the requirement is a well-bonded finish for enduring protection.

In either instance the critical factor is a well-prepared, perfectly clean surface that will anchor the final finish in a permanent bond.

Many important processors place their complete dependence upon the Wheelabrator for this exacting operation, because comparative performance tests have proved it to be the surest and quickest way to the end-result desired.

A test on your products would provide perfect evidence of how this process can benefit you. May we arrange such a demonstration soon?

A LARGE OHIO MANUFACTURER of pneumatic tools found that Wheelabrating not only provided a superior finish than polishing but also eliminated considerable expense. For example, a load of 60 aluminum drill handle castings, (pictured in the machine) is Wheelabrated so thoroughly in two minutes that no further surface preparation is required for the final finish. Formerly a three-minute polishing was required for each piece.

IMPROVED BY WHEELABRATING

ENAMELING

Sanitary ware, including bath tubs, sinks and miscellaneous small pieces, are Wheelabrated prior to enameling in the plants of leading manufacturers. At one typical installation 120 large cast tubs, averaging 300 pounds each, are cleaned per hour in a Wheelabrator Monorail Cabinet. Uniformly and thoroughly cleaned, every surface of a Wheelabrated casting has the proper finish to anchor the enamel to the metal. Here's a partial list of plants that Wheelabrate prior to enameling:

Crane Company, Chattanooga, Tennessee
General Steel Wares, Ltd., London, Ontario, Canada
American Radiator and Standard Sanitary, Baltimore, Md.
Rundle Manufacturing Company, Milwaukee, Wisconsin
Kohler Company, Kohler, Wisconsin
Prizer-Painter Stove Works, Reading, Pennsylvania
Kalamazoo Stove Company, Kalamazoo, Michigan

IMPROVED BY WHEELABRATING

PLATING

The Callander Foundry & Mfg. Co., Guelph, Ontario, Canada operates a complete electro-plating plant in connection with their foundry. They put through an average of 2000 lbs. of cadmium-plating per day. These castings are all Wheelabrated in a 36″ x 42″ Wheelabrator Tumblast, which has been a big improvement over former methods. This concern advises that the matte finish obtained by Wheelabrating provides a perfect bond for plating. Plants like the following Wheelabrate prior to plating:

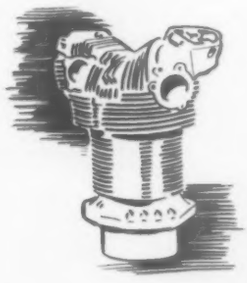
Alaska Freezer Company, Winchendon, Massachusetts
American Tinning & Galvanizing Co., Erie, Pennsylvania
Archer Tinning & Retinning, Chicago, Illinois
West Va. Malleable Iron, Pt. Pleasant, W. Virginia
White Mountain Freezer Company, Nashua, New Hampshire
John Finn Metal Works, San Francisco, California
Andrew Terry Company, Terryville, Connecticut

IMPROVED BY WHEELABRATING

GALVANIZING

Malleable iron pipe fittings are all galvanized directly after Wheelabrating at The Walworth Co., Greensburg, Pa. Two 48″ x 42″ Wheelabrator Tumblasts clean their entire production of fittings. The usual load for each machine is about 1700 pounds. Castings weigh from 4 ounces to 75 pounds apiece. Cleaning time for the larger fittings ranges from 4 to 5 minutes per load; for the smaller fittings 10 to 15 minutes per load. After Wheelabrating the fittings are dipped into zinc ammonia chloride, which acts as a flux. Following this they are galvanized. Wheelabrating prior to galvanizing is being done by plants like these:

Grabler Manufacturing Company, Cleveland, Ohio
Maine Steel Company, South Portland, Maine
National Lock Washer Company, Milwaukee, Wisconsin
Malleable Iron Fittings, Branford, Connecticut
Union Malleable & Manufacturing Company, Ashland, Ohio
Iowa Malleable Iron Company, Fairfield, Iowa
Hercules Foundries, Inc., Los Angeles, California



IMPROVED BY WHEELABRATING

METALLIZING

Aircraft engines that must be corrosion proofed for seaduty are metallized by Wright Aeronautical Corp. To obtain the correct bond for this operation the surfaces of the deep-finned cylinders are Wheelabrated in specially designed machines.

Wheelabrating is extensively used today for preparing metals for many other finishing processes as: Plastic coating, parkerizing, painting, lacquering, anodizing, etc. Plants like these are Wheelabrating prior to such operations:

Wright Aeronautical Corporation, Paterson, New Jersey
Century Foundry Co., St. Louis, Missouri
Chicago Pneumatic Tool Company, Cleveland, Ohio
H. L. Judd, Incorporated, Wallingford, Connecticut
York Bar Bell Corporation, York, Pennsylvania
George K. Garrett Company, Incorporated, Philadelphia, Pa.
Clayton Mark & Company, Evanston, Illinois

American

FOUNDRY EQUIPMENT CO.

505 South Byrkit Street, Mishawaka, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

(*Concluded from page* 184)

pany. **Jack O. Edgerton** has joined the organization's sales department.

♦ ♦ ♦

M. W. Beach has been appointed district sales engineer, with headquarters in Cincinnati, for Parsons Engineering Corp., Cleveland. Mr. Beach will handle sales in the southern Ohio, eastern Indiana and Kentucky territory of the company.

♦ ♦ ♦

Joseph E. Foster, formerly metallurgist with the Dodge-Chicago Plant, Chrysler Corp., Chicago, has been appointed assistant to the director of the Technical Development Program in the national office of the American Foundrymen's Association. A graduate of the University of Illinois, he has had considerable experience in foundry and other metallurgical work, previous associations including International Harvester Co., Chicago; Rock Island Arsenal, Rock Island, Ill.; metallurgist, Olin Industries; Western Cartridge Co., East Alton, Ill., and instructor in heat treatment of steel, Shurtleff College, Alton, Ill.

♦ ♦ ♦

S. C. Massari, now a member of the national office staff, American Foundrymen's Association, Chicago, has been awarded the Legion of Merit for outstanding service during the war while associated with the Chicago Ordnance District as a lieutenant colonel. The citation was for metallurgical accomplishment which increased and streamlined production of a number of tank-automotive items. Prior to entering service in 1942, Mr. Massari was metallurgist, Association of Manufacturers of Chilled Car Wheels, Chicago.

♦ ♦ ♦

John P. Mullen, formerly educational director and member of the management committee, Gray Iron Founders' Society, Washington, has joined the national office staff of the American Foundrymen's Association to handle publicity for the 50th Anniversary Convention and Exhibit. Mr. Mullen's efforts also will be directed toward implementing the National Educational Program of the AFA, an activity of the Technical Development Program. Mr. Mullen was assistant educational director, Investment Bankers Association for nine years. From 1936 to 1943 he served as publicity director, Chicago Mercantile Exchange.

♦ ♦ ♦

Lt. Comdr. Robert S. Green has been released by the Navy and has been elected president of the A. P. Green Fire Brick Co., Mexico, Mo., succeeding his father, **Allen P. Green,** founder of the company, who has been made chairman of the board of directors. An executive committee of the board of directors has been created, which includes **H. B. Plunkett, Lester J. Miller, A. D. Bond, Walter G. Staley,** and **Allen P. Green Jr.**

LT. COMDR. ROBERT S. GREEN

♦ ♦ ♦

Martin F. Jones, recently released from active duty with the Army Air Forces, has joined the sales organization of R. L. Brown, district sales representative of William F. Jobbins Inc., Aurora, Ill., aluminum producer. Mr. Jones, whose territory will include Iowa, Illinois, Indiana, Missouri and Wisconsin, will have his headquarters at the district sales office in Chicago.

♦ ♦ ♦

Craig Mills has resigned as metallurgist of the Werra Aluminum Division, General Malleable Corp., Waukesha, Wis. On May 1 he will become connected with the Racine Aluminum & Brass Co., Racine, Wis. Mr. Mills also plans to act as foundry consultant for noncompetitive foundries in the South Milwaukee, Racine and Kenosha area.

♦ ♦ ♦

F. J. Hoenigmann, for the past six years executive vice president and general manager, Cribben & Sexton Co., Chicago, has been elected executive vice president, Florence Stove Co., Gardner, Mass. He will have charge of all oprations of the company, which has factories in Gardner, Kankakee, Ill., and Lewisburg, Tenn.

♦ ♦ ♦

William M. Jones, formerly eastern representative of the Cleveland Quarries Co., Cleveland, with headquarters in Washington, has been appointed vice president and general sales manager of the company. Mr. Jones will be located in the main office in Cleveland.

♦ ♦ ♦

J. G. Pearce, director of the British Cast Iron Research Association, plans to attend the AFA convention in Cleveland. During his stay in this country he may be reached through Dr. A. B. Kinzel, 30 East 42nd St., New York.

♦ ♦ ♦

A. H. Langenheim has resigned as general manager of the Dayton Malleable Iron Co., Dayton, O. After a short vacation Mr. Langenheim plans to return to the foundry industry.

M. W. BEACH

JOSEPH E. FOSTER

S. C. MASSARI

JOHN P. MULLEN

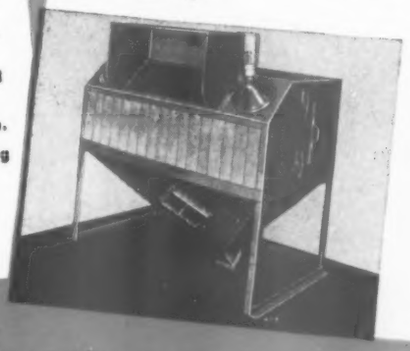
For Cleaning *Faster, Better* and at *Lower Cost*

Choose from the SLY Complete Line of Foundry Cleaning Equipment

SLY TUMBLING MILLS

1. Heavy forged steel trunnions, extra heavy roller bearings.
2. Special door locks — easily operated.
3. Extra heavy gearhead motor.
4. Integral motor platform.
5. Loading and unloading from either side.

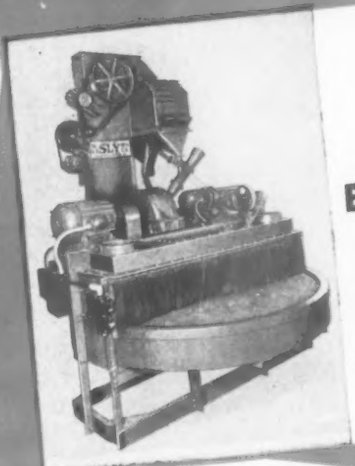
SLY BLAST CABINETS



1. Two lights mounted at front to illuminate castings.
2. Operator's eyes shielded by protective hood.
3. Easy loading and unloading of castings.
4. Used for thorough cleaning of small and intricate parts, or as an auxiliary to larger units.

SLY BLAST ROOMS

1. Overall down-draft ventilation.
2. Ample illumination.
3. Lined throughout with 3-16" wear plates.
4. Floor of grating and perforated plates.

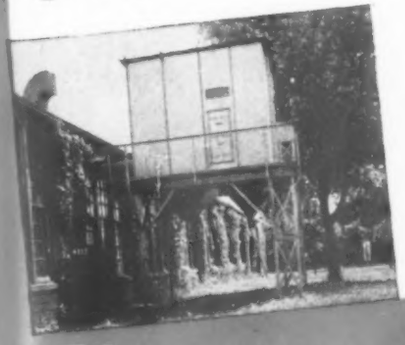


SLY AIRLESS BLAST CLEANING EQUIPMENT

MILLS AND TABLES

Exclusive wheel features for fast and economical cleaning.

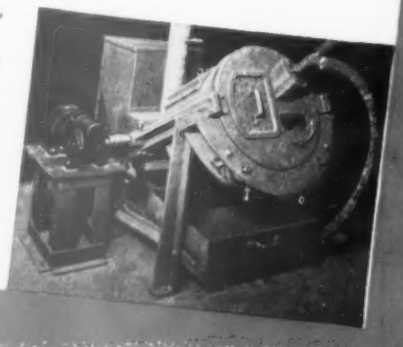
SLY DUST FILTERS



1. More filter cloth—hence greater filtering capacity.
2. Filter bags under tension (patented) insure: (a) minimum resistance to air flow, and (b) complete dust removal.
3. Simpler shaker mechanism—less moving parts, less maintenance.
4. Bags more easily replaced.
5. Automatic control — any degree.

SLY BLAST MILLS

1. Handles quantities of castings, forgings, stampings, hardened steel parts.
2. Tilted barrel with rolling action.
3. Convex perforated bottom plate forms bottom of barrel.
4. Work is constantly turned bringing bottom pieces to top.
5. Stationary head of barrel has large door for loading.



70 YEARS OF SERVICE TO THE FOUNDRY INDUSTRY

THE W. W. SLY MANUFACTURING CO.

4753 TRAIN AVENUE ★ CLEVELAND, OHIO

City of Cleveland

THOMAS A. BURKE
MAYOR

PROCLAMATION

Proclaiming the week of May 6, 1946
as FOUNDRY WEEK in Cleveland

WHEREAS, the more than 5,000 aluminum, brass and bronze, gray iron, magnesium, malleable iron and steel foundries of the United States constitute a great and basic industry, highly important to the industrial life, progress and economic well-being of the Nation and the City of Cleveland; and

WHEREAS, the foundries of Cleveland have contributed immeasurably to the City's growth as the heart and center of an outstanding manufacturing region and have become in number, capacities and skills a large and nationally important segment of the metal-working industries; and

WHEREAS, the foundry industry, which annually produces millions of tons of castings extensively used as components of a wide range of producers' and consumers' durable goods, played a vital, basic part in Cleveland's and the Nation's war effort, and then, with exemplary swiftness, converted to peacetime production and peacetime jobs with a minimum of dislocation; and

WHEREAS, the American Foundrymen's Association, the technical society of the castings industry, is holding its 50th anniversary convention and a massive foundry equipment and materials exposition in Cleveland's Public Auditorium May 6th to 10th, inclusive:

NOW, THEREFORE, I, Thomas A. Burke, as Mayor of the City of Cleveland, do hereby proclaim the week of May 6th of Cleveland's Sesquicentennial Year as FOUNDRY WEEK in Cleveland, and do call the attention of the people of Cleveland to the contribution which is made to the industrial greatness, the wealth and progress of our City and our Nation by the foundry industry; and I extend, in the name of the people of Cleveland, a hearty welcome to the thousands of foundrymen from all over the world who are coming to Cleveland during FOUNDRY WEEK and the year of the City's Sesquicentennial celebration.

Dated this 12th day of April, A.D. 1946.

Thomas G Burke

Mayor.

LINBOND® is as consistent in its high quality and flexibility as the tonal qualities of the finest violin. LINBOND was developed thru careful research and since 1928 has been used in foundries all over the country. Clear in color and clean to work with, LINBOND reduces core losses and production costs. This "consistently good" quality in LINBOND has made it a favorite of foundrymen and it has proven adaptable for Malleable, Gray Iron or the Non-Ferrous field. Write today for further information concerning grade, tensile strength, price and delivery.

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United Oil Mfg. Co.

1429 WALNUT ST., ERIE, PA.

AFA TO MEET IN CLEVELAND FOR GOLDEN JUBILEE

(*Concluded from page* 135)

Menzies, T. Shanks, J. Dearden, B. Gray, E. C. Dickinson, F. Tibberham, T. Lee, A. Jackson, G. W. Bush, E. Owen and M. Royce. M. Laine, secretary of the Association Technique de Fonderie, is the official delegate of the French group, which include R. Dureuil, Marcel Debrock, Jacques Thome, M. Ronceray, M. Gailly and Edouard Dussourd. The Belgian group has Marcel Remy as official delegate of the Association Technique de Fonderie de Belgique, in addition to Paul Ropsy and several others. Dr. Ladislav Jenicek will be the official representative of the Czech foundry association.

Annual business meeting of the AFA, including election of officers and directors, is scheduled for Thursday morning, May 9. Nominees for officers and directors of the association, as previously announced, are: President, Sheldon V. Wood, Minneapolis Electric Steel Castings Co., Minneapolis; vice president, Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va.; directors, Horace A. Deane, American Brake Shoe Co., New York; Stowell C. Wasson, National Malleable & Steel Castings Co., Chicago; Bruce L. Simpson, National Engineering Co., Chicago; J. E. Kolb, Caterpillar Tractor Co., Peoria, Ill., and H. G. Lamker, Wright Aeronautical Corp., Paterson, N. J.

Present Foundation Lecture

Also scheduled for the annual business meeting is presentation of the AFA Foundation Lecture by Dr. G. H. Clamer, Ajax Metal Co., Philadelphia. The 1946 lecture concerns 85-5-5-5 test bars and has for its formal title, "Test Bars for 85 Copper-5 Tin-5 Lead-5 Zinc Alloy—Design and Some Factors Affecting Their Properties." Dr. Clamer, author of the fourth annual Foundation Lecture, is a past president of the AFA and an internationally known authority on the chemistry, melting and casting of nonferrous alloys. The lecture will constitute a report on extended research on test bars and test bar practice, as applied to 85-5-5-5 metal, conducted at Battelle Memorial Institute, Columbus, O., under the sponsorship of the Non-Ferrous Ingot Metal Institute.

Technical program of the convention is one of the largest and most extensive ever arranged by the various divisions of the association. As in the past several years, practical shop courses have been scheduled along with more technical discussion relative to foundry practices, and all programs have been scheduled to occupy a minimum number of days for subjects pertaining to any one phase of the foundry industry. Aluminum and magnesium discussions are scheduled for Monday and Tuesday; the gray iron shop course will be held on Monday through Thursday, with the Gray Iron Division's other sessions planned for Thursday and Friday. Malleable sessions are scheduled for Tuesday and Wednesday, while the Steel Division's program will be concentrated on Thursday and Friday. Sessions relating to brass and bronze will be held on Wednesday, Thursday and Friday.

A full schedule of meetings of the association's various technical committees has been arranged. Dates of these meetings are as follows:

COMMITTEE MEETINGS

Monday, May 6

10 a.m.—Committee on Reclamation & Alloying, Aluminum & Magnesium Division. Chairman: Walter Bonsack.

2 p.m.—Committee on Fluidity Testing. Chairman: K. L. Clark.

4 p.m.—Committee on Core Tests, Foundry Sand Research Project. Chairman: E. C. Zirzow.

Committee on Sand Castings, Aluminum & Magnesium Division. Chairman: Hiram Brown.

Tuesday, May 7

10 a.m.—Executive Committee and Committee on Specifications for Test Bars, Brass and Bronze Division. Chairman: D. F. O'Connor.

12 p.m.—Committee on Inspection of Castings (Luncheon). Chairman: E. G. Levarenz.

1 p.m.—Committee on Sand Shop Operation Course. Chairman: E. Woodliff.

2 p.m.—Committee on Flowability, Foundry Sand Research Project. Chairman: P. E. Kyle.

Committee on Section Size Relationships, Gray Iron Division. Chairman: T. E. Barlow.

3 p.m.—Committee on Test Bars, Aluminum & Magnesium Division. Chairman: D. Basch.

4 p.m.—Subcommittee on Physical Properties of Steel Foundry Sands at Elevated Temperatures, Foundry Sand Research Project. Chairman: H. F. Taylor.

Committee on Inoculation, Gray Iron Division. Chairman: T. E. Barlow.

Wednesday, May 8

8 a.m.—Annual Lecture Committee (Breakfast). Chairman: H. M. St. John.

9 a.m.—Subcommittee on Nickel Alloys of Recommended Practice Committee on Sand Castings, Brass and Bronze Division. Chairman: E. W. Horlebein.

Foundry Sand Research Project Committee on Deformation. Chairman, Wm. G. Parker.

10 a.m.—Committee on Centrifugal Casting, Aluminum and Magnesium Division. Chairman: D. Basch.

12 m.—Gray Iron Division Committee (Luncheon). Chairman, T. E. Egan

Apprentice Training Committee (Luncheon). Chairman, C. W. Wade.

1 p. m.—Subcommittee on College Foundry Courses, Committee on Co-operation with Engineering Schools. Chairman: P. E. Kyle.

2 p.m.—Committee on Co-operation with Engineering Schools. Chairman: F. Sefing.

4 p.m.—Committee on Recommended Practices on Permanent Mold Castings, Brass and Bronze Division. Chairman: Leighton M. Long.

8 p. m.—Committee on Program and Papers, Steel Division. Chairman, H. H. Blosjo.

Thursday, May 9

10 a.m.—Committee on Job Evaluation and Time Study. Chairman: R. J. Fisher.

Committee on Recommended Practices for Centrifugal Casting, Brass and Bronze Division. Chairman: G. K. Dreher.

12 p.m.—Executive Committee and Committee on Program & Papers, Patternmaking Division (Luncheon). Chairman: F. C. Cech.

Chemical analysis Roundtable (Luncheon) Chairman, Carl Sweet.

Committee on Green Sand Properties, Foundry Sand Research Project (Luncheon). Chairman: Bradley H. Booth.

2 p.m.—Subcommittee on Physical Properties of Iron Foundry Molding Materials at Elevated Temperatures, Sand Research Project. Chairman: H. W. Dietert.

4 p.m.—Subcommittee on Foundry Talks to Engineers, Students, Co-operation with Engineering Schools. Chairman: G. K. Dreher.

Committee on Heat Treatment of Steel Castings, Steel Division. Chairman: E. R. Young.

Committee on Mold Surface, Sand Research Project. Chairman: J. B. Caine.

Friday, May 10

8 a.m.—Executive Committee of the Steel Division (Breakfast). Chairman: C. H. Lorig.

12 p.m.—Committee on Non-Destructive Testing, Steel Division (Luncheon). Chairman: C. W. Briggs.

1:30 p.m.—Subcommittee on Microstructure of Brass & Bronze Alloys, Brass and Bronze Division. Chairman: Blake M. Loring.

Management Course Scheduled

College of Engineering, University of Iowa, at Iowa City, will conduct a three-week management course, June 10 to 28. The course will cover the study of production planning, plant layout, motion and time study, wage incentives and related subjects, and is an intensive course for plant managers, foremen, industrial engineers, methods and time study analysts, cost accountants, and office executives.

This will be the eighth year for the university's summer management course. It will be directed by Ralph M. Barnes, professor of industrial engineering, to whom registration and communications should be sent. Tuition and laboratory fee is $150.

Acquires New Plant

Pan American Alloys Inc., New Orleans, has purchased 3 acres of ground and buildings formerly operated by the National Machine & Foundry Co., Scottdale, Pa., for increased production facilities for aluminum alloy, brass and bronze castings.

SEE IT IN CLEVELAND
MAY 6-10th
BOOTH 1417—AISLE 1400

THE *Jack Rabbit*

No. 401-C
Portable Jolt
Squeeze

Again Johnston-Jennings leads the field,— with this newly designed Jolt Squeeze machine, having a one-piece cast steel squeeze frame operated automatically by air. This construction minimizes operator fatigue and assures better, less costly and faster production, even with semi-skilled labor.

A single valve controls all operations. Only two bearings are used in the squeeze frame, thus eliminating wear and assuring a uniform, even squeeze to all parts of the mold.

The newly designed squeeze head equipped with rubber guards to protect the patterns, can be easily adjusted for different height flasks, and three large wheels permit the machine to be moved quickly over uneven floors. Can we send you a completely descriptive catalog?

A COMPLETE LINE PROVEN IN SERVICE INCLUDING—

PLAIN AIR JOLTS
in 12 different sizes

JOLT SQUEEZERS
fast sturdy machines—3 sizes

JOLT STRIPPING PLATES
4 sizes ranging up to 16" draw

JOLT, SQUEEZE, STRIPPING PLATE AND PATTERN DRAWS
Popular for medium service —2 sizes

PORTABLE JOLT ROLL-OVER AND PATTERN DRAW
A heavy duty thoroughly dependable machine—portable

JOLT ROLL-OVER AND PATTERN DRAWS
Fast large capacity machines with roll-out conveyors—4 sizes

Write for fully descriptive catalog giving complete specifications.

THE JOHNSTON & JENNINGS CO.
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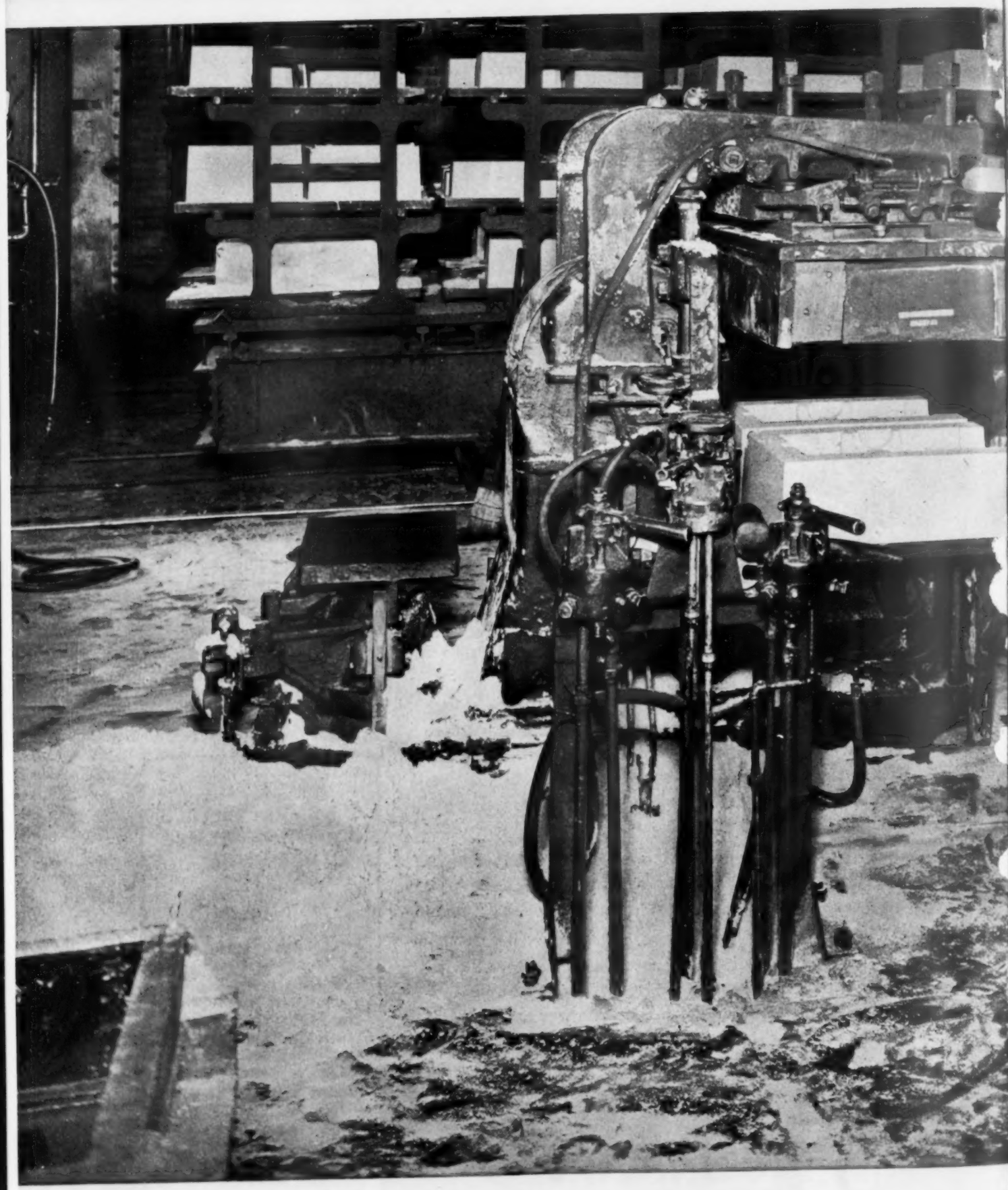
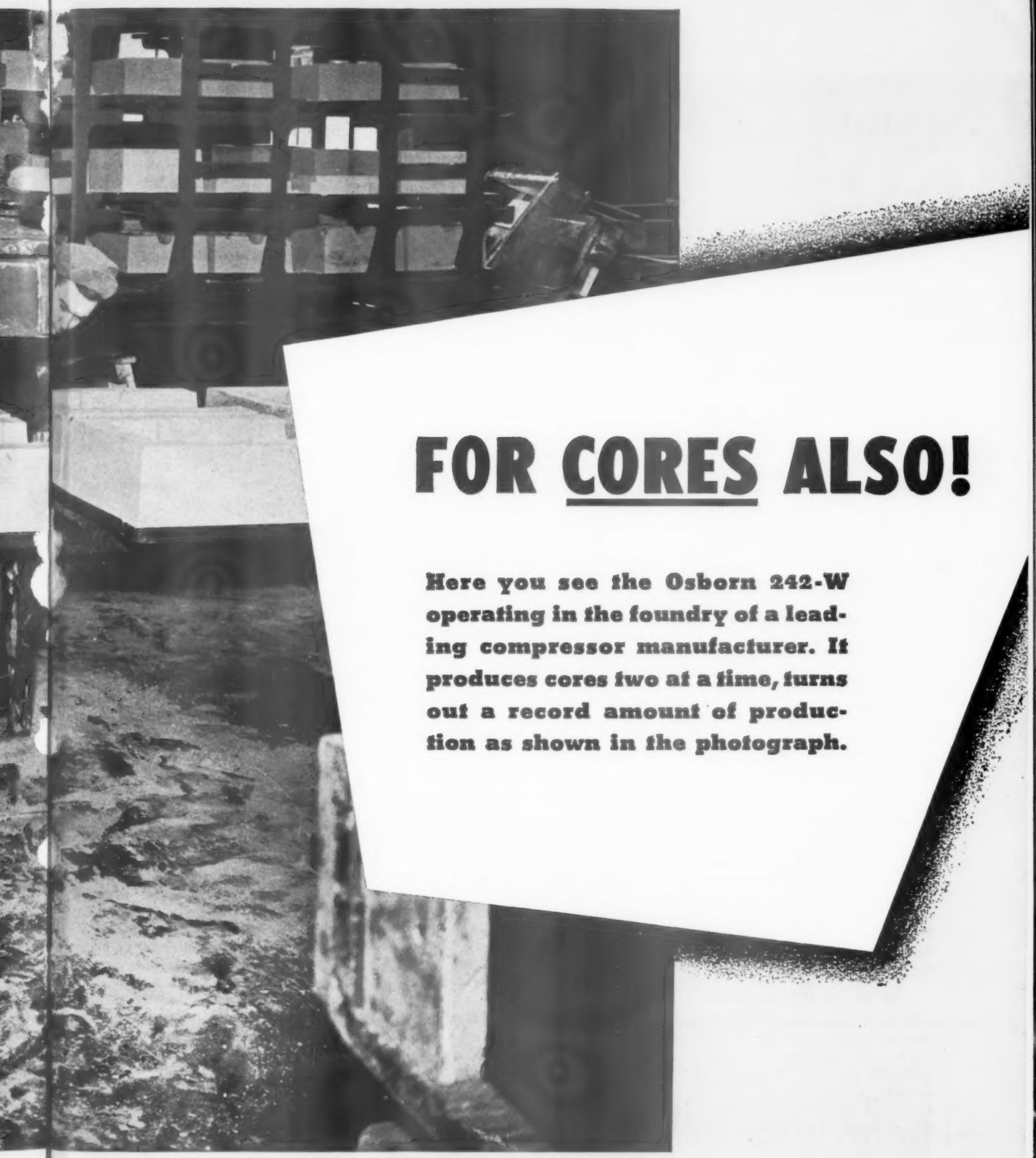
IMPROVED UP-TO-THE-MINUTE MOLDING MACHINES FOR EVERY NEED



THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue Cleveland, Ohio



FOR CORES ALSO!

Here you see the Osborn 242-W operating in the foundry of a leading compressor manufacturer. It produces cores two at a time, turns out a record amount of production as shown in the photograph.

OSBORN

MOULDING MACHINES

MEMBER MANUFACTURER'S ASSOCIATION, INC. FOUNDRY EQUIPMENT

Around DETROIT

By A. H. ALLEN
Detroit Editor, The Foundry

Saginaw Malleable acquiring DPC plant at Danville, Ill., it operated during war. Expansion planned to permit production of both gray iron and malleable castings

FINAL negotiations are being completed by the Saginaw Malleable Iron Division of General Motors for purchase of the Tilton plant at Danville, Ill., which it built and operated for the DPC during the war, as a source of malleable castings for truck axles primarily. Substantial portions of the tools, machinery and equipment are included in the overall purchase agreement, being worked out under direction of B. A. Dollens, general manager of the plant.

The Tilton plant will be continued as an operating unit of Saginaw Malleable, and its facilities will be expanded. The present building, equipped to produce malleable castings up to 360 lb in weight, is being converted to a gray iron foundry, and a new malleable foundry will be built on adjoining property. Contract for construction has been let, but how it will be affected by new government restrictions on all forms of construction remains to be seen. Both the malleable and gray iron castings to be produced in the two plants for regular commercial use will be much lighter than those produced in wartime, none to be much over 50 lb.

Start Production in August

Every effort is being made to have gray iron production started by early August. Construction and operation of the new malleable plant will have to wait for necessary materials. When conversion is completed, the gray iron plant will employ between 700 and 800, and the working force is expected to be doubled when the malleable unit is completed.

The project is another indication of how seriously GM divisions need gray iron castings, despite the fact Chevrolet, Pontiac, Cadillac and Buick already are operating large foundries, and most of these are in process of enlargement. On brake drums alone, Chevrolet has sighted a critical bottleneck, and is in process of assisting a Chattanooga, Tenn., foundry to expand facilities for output of a reported 15,000 brake drums daily. This may be in connection with the new lightweight economy model which Chevrolet has started through the works for eventual manufacture in the Cleveland area, although here again the governmental brakes applied to new construction may result in extended delay.

Everywhere the story is the same on new construction—cost soaring far beyond earlier estimates and forcing cutbacks in planning; construction materials far below the needed volume, workers still in slow-motion effort.

Beset With Many Difficulties

As George Miehls, president of Albert Kahn, puts it: "The building of your post-war plant is beset with many difficulties. Under conditions prevailing at present you do not know, and you cannot tell, how much the plant will cost. Ordinary materials of construction are scarce, some are practically nonexistent; quality materials of many kinds cannot be obtained at all. Your bricklayers, your ironworkers, your carpenters have an average age today which, but for the eternal optimism and initiative that is America's, would be alarming. What is the answer? How is the material-starved, manpower-starved but extremely ambitious construction industry to provide the numberless facilities for manufacture that are crying to be built?

"You know the situation that exists today in the brick industry. Only one-third of all the brick manufacturing capacity of the country is operating, and this one-third is operating at less than 40 per cent capacity. Why? Because they cannot produce brick for the price that they are obligated to sell for. Consequently, no brick. There are practically no seasoned wood block for floors. There is little available in ceramic or glazed tile.

"We recently had a strike in the steel industry. The workers gained an increase in wage, and the steel manufacturers gained an increase in their steel price. The fabricator of that steel also gave his workers an increase in wage. That is fine. Now we can get fabricated steel to at least make up the frame of a building. But can you tell the owner how much he will pay for that steel? You cannot; because, while the steel fabricator knows he will have to pay more for his steel; while he knows that he will have to pay more for his own labor, he does not know how much of this increase he can pass on to the consumer. The result? Independent fabricators refuse to tender at all; the larger fabricators, subsidiaries of the steel companies, are willing to take the gamble that they may be permitted to recover a part at least of their added costs. How much? Nobody knows. The OPA has not decided."

Resumption of operations in General Motors foundries was not uniform. Pouring has been started at the Cadillac foundry and reportedly will be continued for about three months, in which time it is hoped to build up a sufficient backlog of castings to permit a six-week shutdown for completing the modernization program started months ago and involving relocation of cupolas, molding machines, sand handling and conveyor lines.

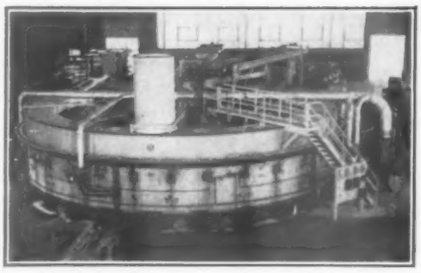
Face Large Labor Turnover

Pontiac issued recalls for its men but met with numerous difficulties in the face of the high degree of labor turnover. A number of its men had taken jobs in another foundry in the area, and the report was they were expected to leave en masse and return to Pontiac once the strike was settled, creating a nice problem for the employer they left. A further complicating factor was that many, particularly in the ranks of the better-grade and higher-skilled workers, had found other jobs which they decided to keep, despite their accumulated seniority at Pontiac.

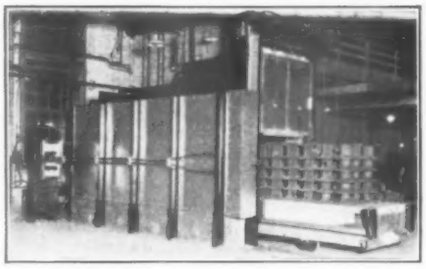
At Buick, continued bickering over local grievances kept the entire plant closed for a period after settlement of the strike. Principal bone of contention was the union's demand for reinstatement of two men discharged from the aluminum foundry during wartime for their continued fomenting of slowdowns and work stoppages there. Physically, the Buick foundry was in perfect shape for resumption of production, most modernization work having been completed by last November when the GM strike started.

Chevrolet Gray Iron likewise was in good position to start pouring, although the extensive expansion program there,

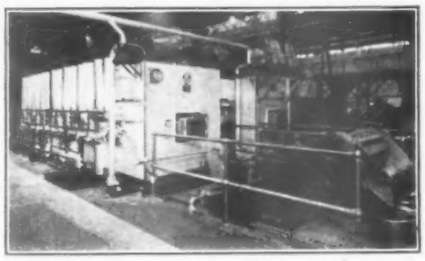
(*Concluded on page* 200)



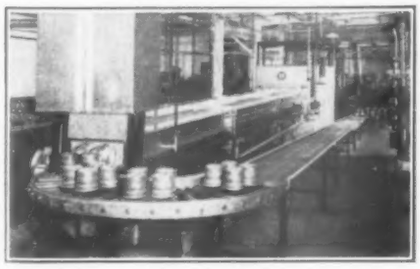
Heats 35,000 lbs. Billets Per Hr. Billets up to 10" x 32" are uniformly heated in this large EF oil fired rotary hearth furnace. Has hydraulically operated charging and discharge mechanism. Other EF rotaries available for various processes; in sizes ranging from 250 lbs. per hr. up. Write The Electric Furnace Co., Salem, Ohio, regarding your requirements.



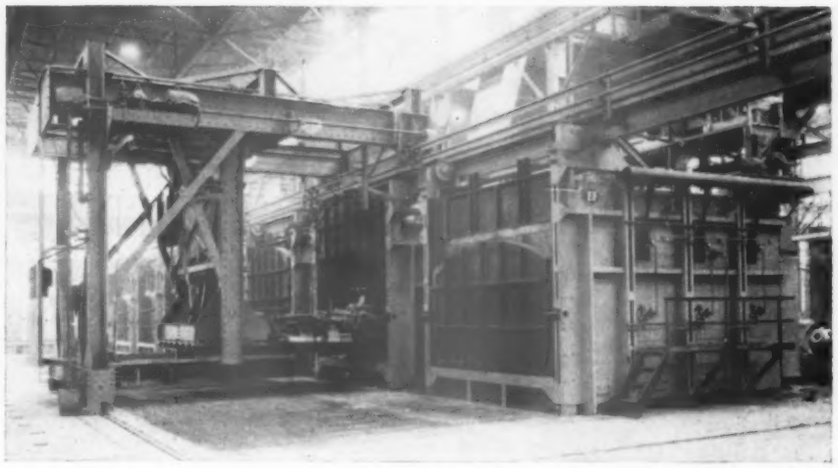
Car Type Furnaces. For annealing castings, bar stock plates; stress relieving welded structures; heat treating armor plate, etc. The above furnace is annealing steel castings. We build them either electric or fuel fired in sizes to handle any size product or for any size charge. The Electric Furnace Co., Salem, Ohio.



Scale Free Heat Treating Small Parts. 175 to 2000 lbs. of small and medium size parts and products, per hour, are scale-free hardened in EF continuous chain belt furnaces such as shown above. We build them either electrically heated or fuel fired. Send for data on sizes to handle your production. The Electric Furnace Co., Salem, Ohio.



Copper Brazing Heavy Assemblies. An EF roller hearth furnace copper brazing heavy steel assemblies. Other types are handling aluminum, brass, and steel assemblies ranging from small radio tube parts up to large automotive and aircraft units. Information on furnaces and brazing process available from The Electric Furnace Co., Salem, Ohio.



An installation of EF gas fired furnaces with quench and gantry crane for various annealing and heat treating cycles on large castings.

For
Production Furnaces
For Handling Castings
or other products in
Any Size or Shape

FURNACES OIL, GAS or ELECTRIC
For Every Heating and Heat Treating Process

Aluminum Brazing
Annealing
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Bright Hardening
Copper Brazing
Controlled Atmosphere
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Drawing
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Forging
Hardening
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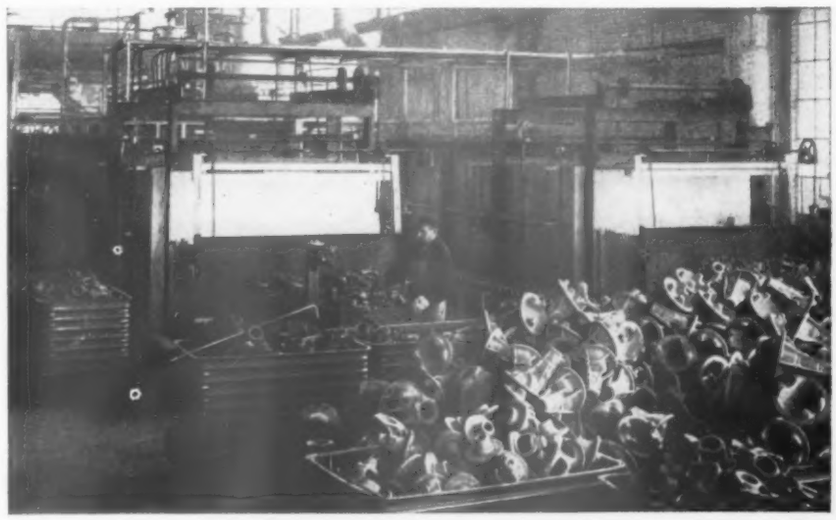
We Build the Furnace to Fit Your Job
THE ELECTRIC FURNACE CO.
SALEM, OHIO

For Production Furnaces, For Any Process or Production, Consult

The Electric Furnace Co., Salem, Ohio

No Job Is Too Large or Too Unusual

Scale-free, uniformly annealed castings are discharged continuously from the EF special atmosphere furnaces shown below.



For sounder castings and lower cost foundry operation

. . . Functional Photography

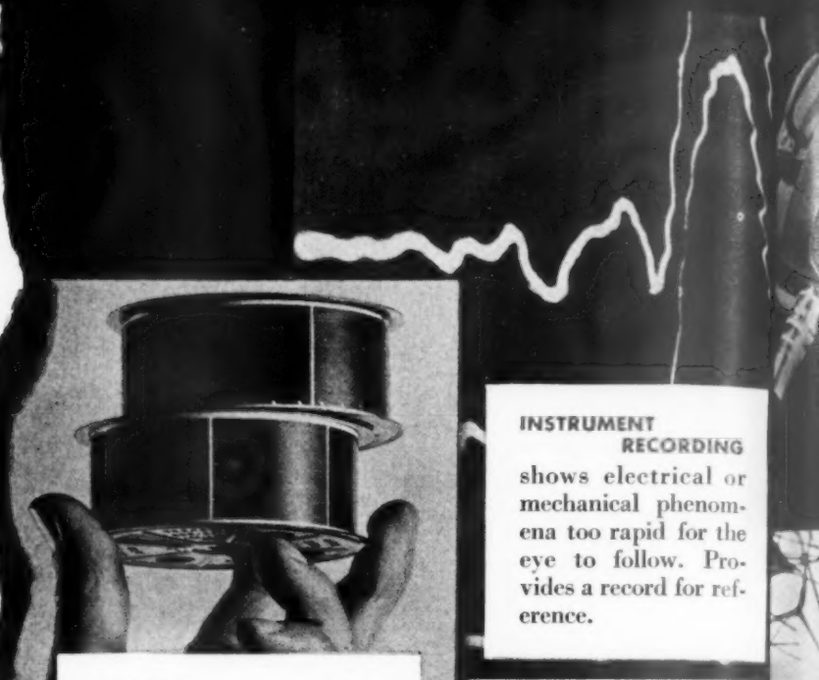
Adapted to the needs of modern foundry practice, practical in its approach to those needs, Functional Photography makes available to the foundryman photography's unique powers to reveal . . . to magnify or reduce . . . to record phenomena, data, information, much of which is beyond the range and ability of the human eye.

In research and production, in the training of new workers, in over-all administration, Functional Photography offers sound methods of improving foundry workmanship, speeding sound production, and lowering the costs of foundry operations.

Shown here are twelve examples of how Functional Photography may be useful to you. For more complete information, write today for the new 20-page "Functional Photography" booklet.

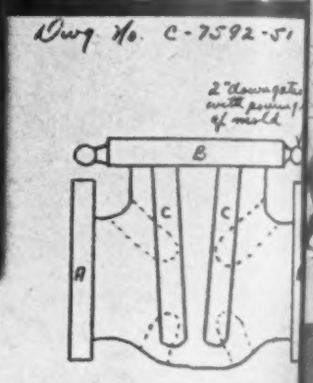
Eastman Kodak Company
Rochester 4, New York

You will be welcome at the Kodak exhibit at the Golden Anniversary Foundry Show in Cleveland, booth 1916. See Functional Photography at work—it will help you to determine its value to your foundry.

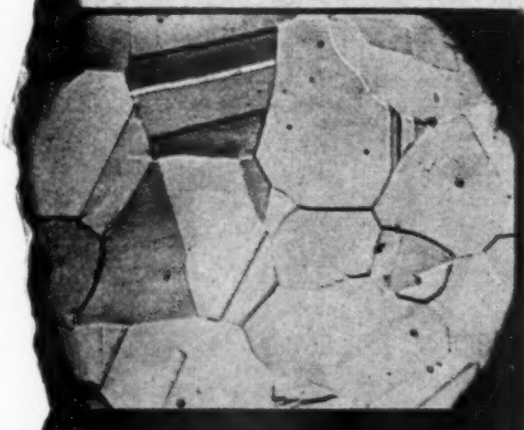


RECORDAK puts hundreds of big, bulky drawings or other records on single small roll of microfilm, saves 98% in space, 99% in weight. Safeguards valuable records.

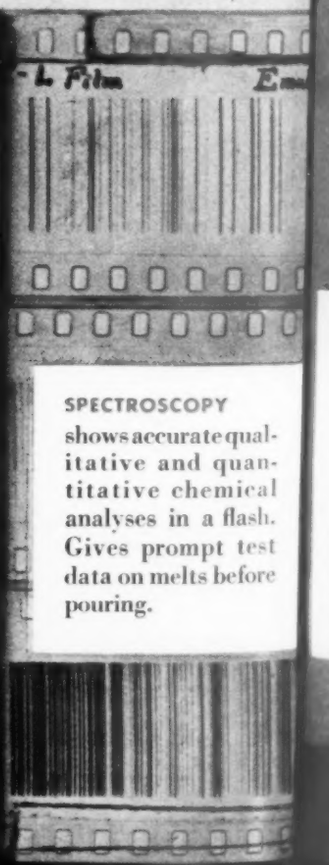
INSTRUMENT RECORDING shows electrical or mechanical phenomena too rapid for the eye to follow. Provides a record for reference.



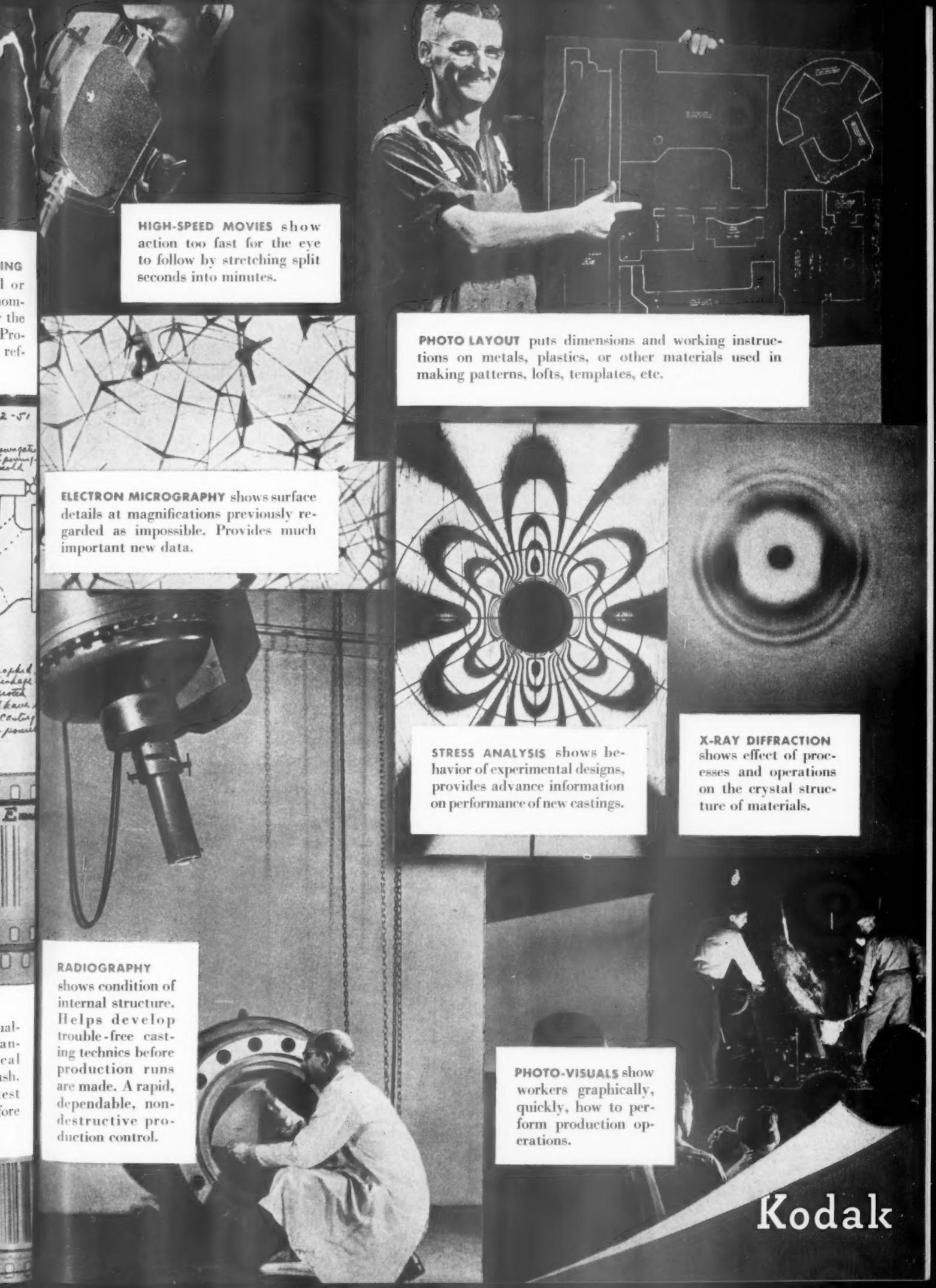
DOCUMENT COPYING shows drawings, documents, records, etc. to all interested in large- or small-scale copies of original material.



PHOTOMICROGRAPHY shows changes in grain structures created by varying alloy compositions. Provides magnifications up to 5000 diameters.



SPECTROSCOPY shows accurate qualitative and quantitative chemical analyses in a flash. Gives prompt test data on melts before pouring.



HIGH-SPEED MOVIES show action too fast for the eye to follow by stretching split seconds into minutes.

PHOTO LAYOUT puts dimensions and working instructions on metals, plastics, or other materials used in making patterns, lofts, templates, etc.

ELECTRON MICROGRAPHY shows surface details at magnifications previously regarded as impossible. Provides much important new data.

STRESS ANALYSIS shows behavior of experimental designs, provides advance information on performance of new castings.

X-RAY DIFFRACTION shows effect of processes and operations on the crystal structure of materials.

RADIOGRAPHY shows condition of internal structure. Helps develop trouble-free casting technics before production runs are made. A rapid, dependable, nondestructive production control.

PHOTO-VISUALS show workers graphically, quickly, how to perform production operations.

Kodak

(*Concluded from page* 196)

involving four new cupolas, has been stalled for months. Production of castings for Oldsmobile in past years has been divided between the Buick and Pontiac foundries, but the demand from their own motor lines is mounting to the point where Olds is being forced to look for other sources. Some work has been placed with Campbell, Wyant & Cannon, although Pontiac probably will continue to supply a portion of the Lansing producer's needs.

Continental Motors at Muskegon is going to be in the market for substantial quantities of gray iron castings for engines for Frazer and Kaiser automobiles to be built at Willow Run. These newcomers to the industry report their dealers now have firm orders for about 280,000 Frazer cars and 250,000 Kaiser models. Initial production of the former is slated to start this month (May) when schedules call for 500, increasing to 2500 in June and 8000 in July. The Kaiser, it is hoped, will be started some time this summer. Both are powered by 6-cylinder conventional engines built by Continental. Lakey Foundry & Machine Corp. has long been a principal source of gray iron castings for Continental, since its plant adjoins that of the engine builder in Muskegon.

Continental began production last month on a new line of industrial and transportation diesel engines ranging from 25 to 150 hp in size. The five now in production include two 4-cylinder and three 6-cylinder models, using the same principal components as those employed in the company's line of gasoline engines. Ordinarily it is necessary to "beef up" cylinder walls, heads, pistons, bearings, etc., in diesel engines because of the higher pressures involved, but in this new series of engines this has been avoided by the introduction of a so-called "dyna-cell" in the combustion chamber which permits a delayed combustion action and resulting lower working pressures.

Redesigned power plant will be incorporated in the forthcoming Commander model which Studebaker is unveiling shortly. Thus far, Studebaker has confined its production to the smaller Champion model, but closed down in March for a complete changeover to 1947 models, including the Champion, the larger Commander and eventually the 8-cylinder President series. Improvements worked out during wartime in engines for military trucks are said to be featured in new passenger car engines.

Much to-do is heard currently of the necessity of improving working conditions in foundries, paying more attention to employe comforts and conveniences, ventilation, dust collection and related items of good housekeeping. There seems general agreement as to the advisability of such programs, but unfortunately human nature being what it is, they can often backfire. One gray iron foundry manager in this area, commenting wryly on "good housekeeping" programs, said his plant had carried forward a regular schedule of improvements and conveniences for employes but after each improvement was effected a subsequent drop in production was encountered. The trouble was that the installed aids to comfort and morale proved too tempting to the recipients who simply used them as an excuse for staying off the job.

Perhaps it is necessary to draw a fine line of distinction between "luxuries" and genuine contributions to more healthful and efficient working conditions. A handsomely upholstered leather chair in a foreman's office may be a great thing for his morale and at the same time too powerful a lure from his work along the pouring line.

Nonferrous Founders To Meet May 6

Annual meeting and election of officers of the Non-Ferrous Founders' Society will be held concurrent with the annual meeting of the American Foundrymen's Association. This meeting will be held on Monday, May 6, at the Cleveland Athletic Club, thus giving members a chance to attend the program of the AFA between May 7 and 10.

Special talks on Monday afternoon will be by James R. Hoagland, former chief of the Copper Division, WPB Washington, and now with the Reconstruction Finance Corp. on surplus metals, whose subject will be "The Future of the Brass and Bronze Industry"; also D. A. Potter of Universal Casting Co., Chicago, who will speak on "Precision Castings."

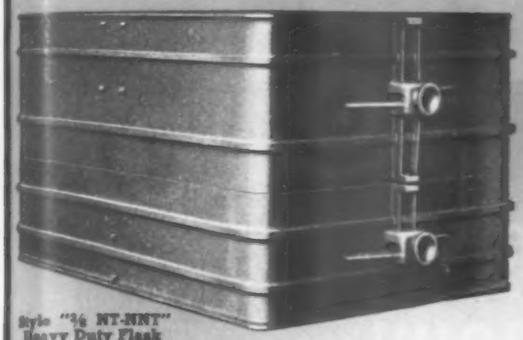
The Non-Ferrous Founders' Society now has established active chapters in Chicago, Detroit, Cleveland, Pittsburgh, greater New York, Connecticut and Boston. Plans are also underway for chapters in Buffalo, Cincinnati, St. Louis and on the West coast.

SCHEDULE FOR CLEVELAND PLANT VISITATIONS ARRANGED

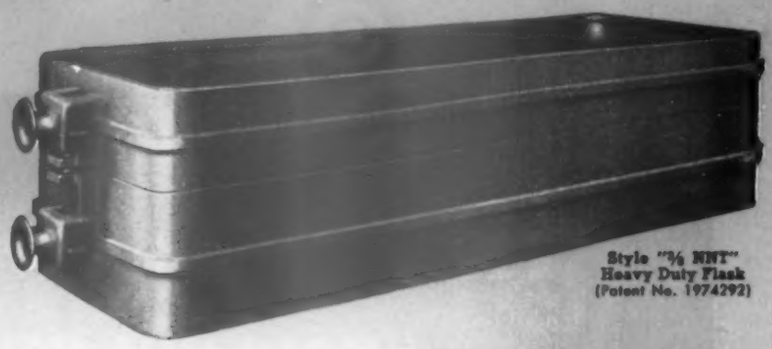
VARIOUS foundries of the Cleveland area will be open for inspection by visitors attending the 50th Anniversary Convention of the AFA, May 6-10, it has been announced by the Plant Visitation Committee of the Northeastern Ohio Chapter. Hours during which these visits may be made on the different days are indicated in the accompanying table. The plants selected for inspection include nonferrous foundries, pattern shops, steel foundries, heavy gray iron foundries and light iron producers, thus affording a wide choice to visitors. John M. Price, Ferro Machine & Foundry Co., is chairman of the Plant Visitation Committee, and Bruce Aiken, Crucible Steel Casting Co., is vice chairman.

	May 6	May 7	May 8	May 9	May 10
Nonferrous					
Wellman Bronze & Aluminum Co.	.....	.....	9-12	9-12	10-12
John Harsch Bronze & Foundry Co.	.....	.....	.....	10-12 2- 5	2- 5
Pattern Shops					
Motor Pattern Co.	9-12 1- 4:30	9-12 1- 4:30	9-12 1- 4:30	9-12 1- 4:30	9-12 1- 4:30
Master Pattern Co.	10-12 1- 4	10-12 1- 4	10-12 1- 4	10-12 1- 4	10-12 1- 4
Wellman Bronze & Aluminum Co.	.....	.....	9-12	9-12	.....
Steel					
West Steel Casting Co.	9-12	9-12	9-12	9-12	9-12
Crucible Steel Casting Co.	9-11:30	9-11:30	9-11:30	9-11:30	.....
Heavy Gray Iron					
Fulton Foundry & Machine Co.	9-12	9-12	9-12	9-12	9-12
Bowler Foundry Co.	9-11:30	9-11:30	9-11:30	9-11:30	.....
Light Iron					
Taylor & Boggis Foundry Co.	9-11:30	9-11:30	9-11:30	9-11:30	.....
Allyne-Ryan Foundry Co.	.....	9:30-11:30	9:30-11:30	.....	.....
Ferro Machine & Foundry Co.	.....	9:30	9:30	9:30	.....
Ohio Foundry Co.	9-11:30	9-11:30	9-11:30	9-11:30	9-11:30
Superior Foundry Co.	.....	9-11:30 1- 4	9-11:30 1- 4	.....	.....

Visit the Sterling Exhibit Booth No. 509 at the Cleveland Foundry Show



Style "¾ NT-NNT" Heavy Duty Flask (Patent No. 1974292)



Style "¾ NNT" Heavy Duty Flask (Patent No. 1974292)

Style "¾ NT-NNT" with Heavy Duty Clamps and Clamping Bars (Patent No. 1974292)

LOOK TO Sterling FOR QUALITY FOUNDRY FLASKS!

It is an impressive fact that more than 4,000 American foundries are now using dependable Sterling Steel Flasks. And these foundries continue to specify Sterlings whenever they require more flasks. Engineered on standards of indestructibility . . . yet lightweight and compact . . . Sterlings are available in a variety of styles and shapes . . . all welded, special rolled steel sections . . . strong but light, for speed and endurance. Also a complete line of flask accessories and other foundry equipment.

STERLING WHEELBARROW CO.
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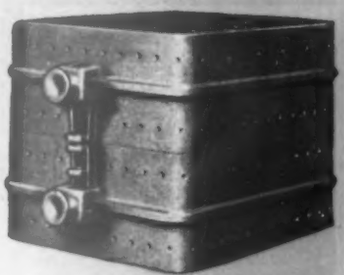
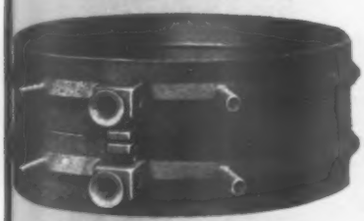
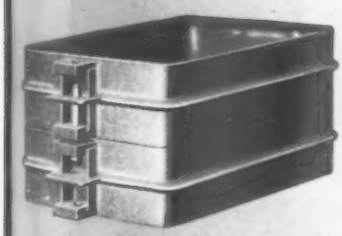


Style "¾ NNT-NT" Heavy Duty Flask (Patent No. 1974292)

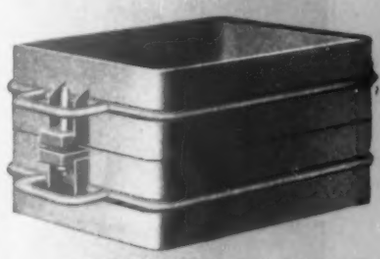


Style "BBLT" with Trunnions and Two-Man Lift Handles.

Style "LL" with Angle Re-inforcement and Two-Man Lift Handles

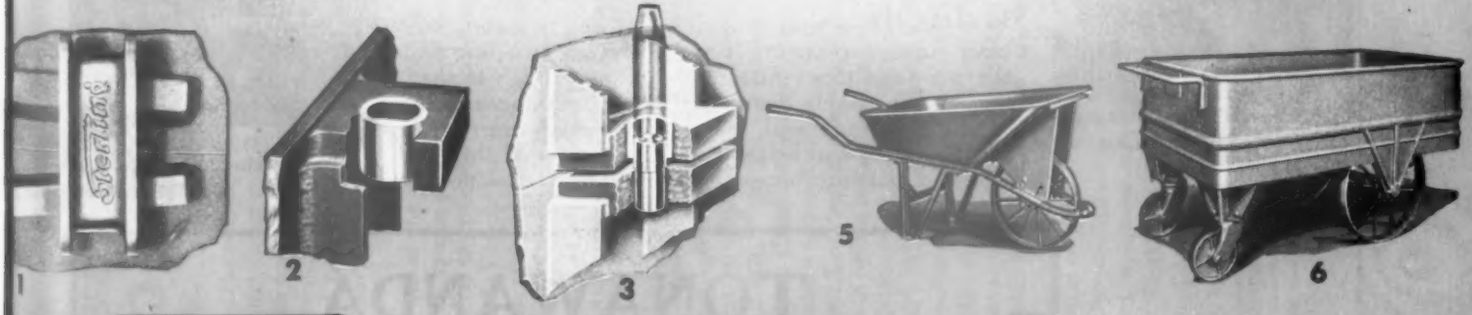


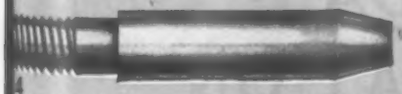
Style "A" — Double Pin Lugs



Style "AA" with Loop Handles

STERLING FOUNDRY ACCESSORIES



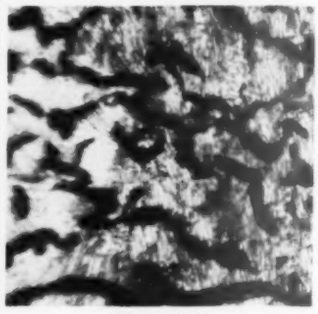


(1) Sterling Flask Clamp. (2) Standard Hardened Steel Bushing. (3) Stub Pin Shift-Proof. (4) Standard Type "S" Flask Pin. (5) No. 116A Wheelbarrow with 3/16" steel plate reinforcement for extra hard usage. (6) Heavy Duty Casting Truck. (7) Heavy Duty Cart with 3-point Landing. Other Sterling foundry equipment includes: Flask Bars — Core Plates — Bottom Boards — Upsets — Hardwood Wedges — Slag Buggies — Core Trucks, etc. Write for catalog.

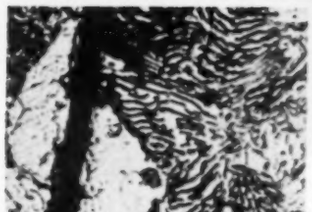
Sterling FOUNDRY EQUIPMENT

Here's what we mean by "FOLLOW THROUGH"

REGULAR PIG
1000 diam. etched



G-IRON PIG
1000 diam. etched



CASTING (35%) REGULAR PIG
500 diam. etched

*G-IRON is graphitized pig iron. A patented blast furnace process refines the grain structure of the pig—and this refinement follows through to the casting. The finely distributed graphite reduces chill in thin sections and increases fluidity—improves machinability and helps to overcome internal shrinkage and porosity between thin and heavy sections.

CASTING (35%) G-IRON PIG
500 diam. etched

TONAWANDA
for sound castings

TONAWANDA IRON CORPORATION

NORTH TONAWANDA, N. Y.

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

A GLOSSARY OF TERMS EMPLOYED IN THE FOUNDRY

(Continued from April issue)

PERMANENT MOLD—A long-life mold into which metal is poured by gravity.

PERMEABILITY—The property in sand molds which permits the passage of gases. Magnetic permeability of a substance is the ratio of the magnetic induction of the substance to the magnetizing field to which it is subjected.

PHASE—A constituent which is completely homogeneous both physically and chemically separated from the rest of the alloy by definite bounding surfaces; for example, austenite, ferrite, cementite. Not all constituents are phases, pearlite for example.

PHOSPHORUS—One of the elements with the chemical symbol P. Its formula weight is 123.92; specific gravity 1.82, and melting point 44.1 C.

PICKLING—Removal of oxide scale and sand from metal objects by treating in an acid bath; usually a 10 per cent solution of sulphuric acid.

PIG IRON—Product of the blast furnace by the reduction of iron ore. Also the over-iron in the foundry poured into pig molds.

PIG BED—Open sand molds in the blast furnace casting floor.

PIG MACHINE—An endless belt of metal molds filled with iron from blast furnace ladle.

PIN HOLE—Small hole under the surface of the casting.

PINS, FLASK—Hardened steel locating pins used on flasks to insure proper register of cope and drag molds.

PLATES, BOTTOM—Usually metal plates on which molds are set for pouring.

PLATES, CORE DRYING—Straight, flat plates of metal or heat resisting composition on which cores are placed for baking.

PLUMBAGO—Graphite in powder form.

PNEUMATIC TOOLS—Grinders, rammers, drills, etc. operated by compressed air.

POUR—Discharge of molten metal from the ladle into the mold.

POURING BASIN—Reservoir on top of the mold to receive molten metal.

POURING DEVICE—Mechanically operated device in which a ladle is set for controlling the pouring operation.

POWDERED COAL—Finely ground, high-volatile coal used for heating furnaces and annealing ovens in the malleable foundry industry.

POWDERED COAL EQUIPMENT—Pulverizers, burners, blowers, etc., used in preparing and burning powdered coal.

PRICKER—Projection on a plate or arbor.

PRINT BACK—After the surface of a mold is dusted with graphite facing, the pattern is replaced, rapped into position and again removed.

PROPORTIONAL LIMIT—The greatest stress which a material is capable of developing without deviation from the law of proportionality of stress to strain.

PURIFIERS, FLUX—Various materials added to molten metals and alloys for the purpose of removing impurities, gases, etc.

PYROMETER—An instrument for determining elevated temperatures.

QUENCHING—Rapid cooling by immersion in air, gas or liquids.

RADIOGRAPHIC TESTING—Use of X- or gamma rays in studying the internal structure of objects to determine their homogeneity.

RADIUM—One of the elements with the chemical symbol Ra. Its formula weight is 226.05, and specific gravity 5.042. Radium and its salts are used in gamma ray radiography.

RAM—To pack the sand in a mold.

RAMMER—Tool for ramming the sand.

RAM-OFF—Casting defect caused by improper ramming.

RAPPING PLATE—Metal plate attached to a pattern to permit rapping for removal from the sand.

RATTLER—See tumbling barrel.

RECARBURIZER—Any carbonaceous material, pig iron, or alloy added to molten steel to increase the carbon content.

RECUPERATOR—A refractory checkerwork or other installation heated by furnace exhaust gases. Air is drawn through sections or tubes and preheated to promote more efficient combustion.

REDUCTION OF AREA—Difference between the original cross-sectional area of a tension test bar and that of the smallest area at the point of rupture. Usually expressed as a percentage of the original area.

REFRACTORY—Usually a ceramic material resistant to high temperatures, molten metal and slag attack.

RESIDUAL INDUCTION—Magnetic induction remaining in a magnetized material after the magnetizing force has been removed.

RESISTIVITY—Resistance of a material to the transmission of electrical energy. It is measured by the resistance of a body of the substance of unit cross section and unit length.

RESPIRATOR—Filtering device covering operator's nose and mouth which prevents inhalation of dust and fumes.

RIDDLE—Hand or power operated device for removing large particles of sand or foreign material from foundry sand.

RIGGING—Equipment necessary to make a mold.

RISER—Reservoir of molten metal attached to the casting to compensate for the internal contraction of the casting as it solidifies.

ROCKWELL HARDNESS TESTING—Method of determining the indentation hardness by measuring the depth of residual penetration by a steel ball or a diamond cone.

ROD STRAIGHTENER—Machine for straightening core and mold wires and rods for re-use.

RUMBLER—See tumbling barrel.

RUN-OUT—Metal flowing through a defect in the mold.

This is the sixth installment of an extensive glossary of foundry terms compiled by Edwin Bremer from a wide variety of sources. In the development of this material a great amount of help has been secured from the *Steel Castings Handbook* published by the Steel Founders' Society of America, Cleveland; *American Malleable Iron* published by the Malleable Founders' Society, Cleveland, and from unpublished work of a Committee on Foundry Nomenclature of the American Foundrymen's Association, Chicago. THE FOUNDRY wishes to thank all sources from which this material has been obtained.

THE EDITORS

A GLOSSARY OF TERMS EMPLOYED IN THE FOUNDRY

RUNNER—That portion of the gate assembly connecting the downgate or sprue with the casting.

RUNNER BOX—See pouring basin.

SAND, BACKING—Sand in mold back of the facing.

SAND, BANK—Sand from a bank or pit.

SAND, BLACK—Sand which has been used more than once.

SAND, BLAST—Sand used in an abrasive blasting machine for cleaning castings.

SAND BLAST—Sand driven by a blast of compressed air (or steam); used to clean castings; to cut, polish or decorate glass or other hard substances; for cleaning building fronts, etc.

SAND BLAST EQUIPMENT—Includes barrels, cabinets, tables, rooms and other types of equipment employing the sand blast principle for cleaning castings.

SAND BLAST NOZZLE—Opening through which the sand-air stream emerges and is projected against the object to be cleaned. Due to the highly abrasive quality of the sand-air stream the nozzle is composed of abrasion resistant material such as boron carbide; ceramics, etc.

SAND, CLAYEY—Sand containing a high percentage of clay.

SAND CONTROL—Procedure whereby various properties of sand such as fineness, permeability, green strength, moisture content, etc., are adjusted to obtain castings free from such defects as blows, scabs, rat tails, veins, etc.

SAND CONTROL EQUIPMENT—Testing instruments such as moisture determinators, permeability air-flow apparatus, etc. for determining the various physical properties of sands.

SAND, CORE—Sand used in making cores.

SAND CUTTER—A machine used to mix sand by use of a blade device which cuts the sand over.

SAND CUTTING—Preparing sand for molding either by hand or by machine.

SAND DRYER—Apparatus for removing moisture from sand.

SAND, DUNE—A sharp, wind-blown sand from the shores of lakes or ocean.

SAND, FACING—Prepared sand used next to the pattern.

SAND, FAT—Sand with a high percentage of clay.

SAND, FLOOR—Sand used in floor molding.

SAND, FRESH—Sand which has not been used.

SAND HEAP—Pile of sand on the foundry floor.

SAND, LAKE—Sharp sand from vicinity of lakes.

SAND, LEAN—Sand low in bond or clay.

SAND MIXER—See mixer.

SAND, MOLDING—Sand used to make molds.

SAND MULLER—A machine for mixing sand by a kneading and squeezing action.

SAND, NATURAL—Naturally bonded sand as distinguished from that formed synthetically.

SAND, OLD—Sand that has been used repeatedly.

SAND, OPEN—Sand through which gases can pass freely.

SAND, PARTING—See parting sand.

SAND PREPARATION EQUIPMENT—Apparatus and machines such as mixers, aerators, etc., for putting sand in the proper condition for use.

SAND RAMMER—See rammer.

SAND RECLAIMER—Equipment for removing extraneous material from used sand and reconditioning it for further use.

SAND, SILICA—Sand composed of almost pure silica.

SAND, SYNTHETIC—Molding sand prepared by adding clay or other bond to sand practically free of those materials.

SAND SLINGER—Molding machine which throws sand into a flask or corebox, by centrifugal action.

SAND STRIP—A strip along the lower inside edge of a flask.

SAND TEMPERING—Adding sufficient moisture to core or molding sand to make it workable.

SAND THROWER—See sand slinger.

SAND, USED—Sand which has been used for making molds.

SAND, WEAK—See sand, lean.

SCAB—A blemish on a casting caused by eruption of gas from the mold face.

SCAFFOLD—A bridge of slag in the cupola. Also charging floor (British).

SCLEROSCOPE—An instrument for determining hardness which is measured by the drop and rebound of a diamond-tipped hammer.

SCREENS—See sieves.

SEA COAL—Finely ground bituminous coal.

SELECTIVE HARDENING—Method of obtaining different degrees of hardness in different areas.

SEMISTEEL—A misnomer to indicate steel scrap is a component in the metal charge for producing gray iron.

SEPARATOR—Any machine, device or apparatus which separates a mixture into its constituent parts. Equipment available includes abrasive separator for removing extraneous material from abrasive used in abrasive blast units; air-oil-water separators for removing oil and water from compressed air; magnetic separators for removing magnetizable material such as iron from sand, non-ferrous material, etc.

SEPARATOR, ABRASIVE—See separator.

SEPARATOR, AIR-OIL-MOISTURE—See separator.

SEPARATOR, MAGNETIC—See separator.

SET-OFF BENCH—See off set.

SHAKEOUT (SHAKE OUT)—The operation of removing castings from the mold.

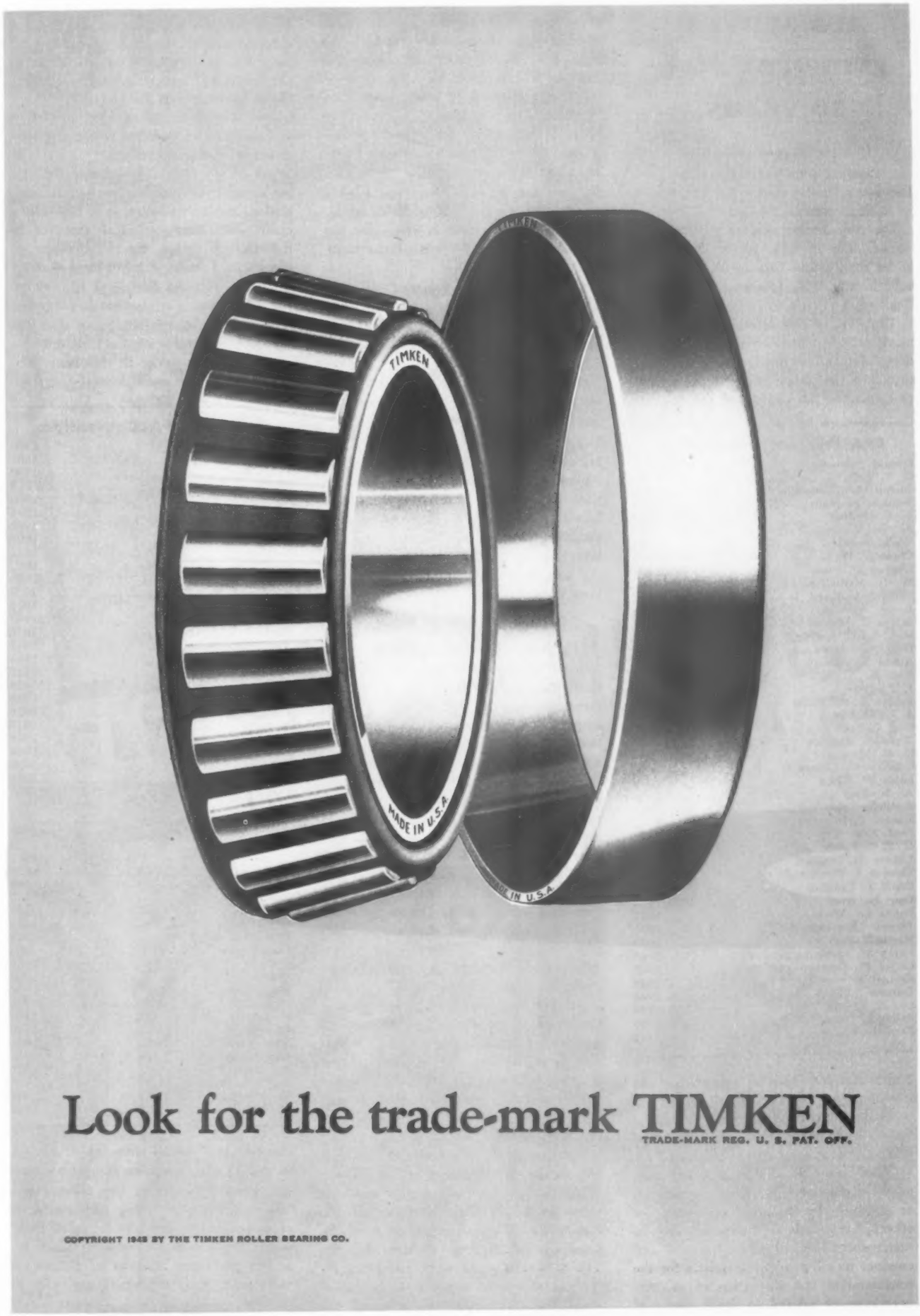
SHAKEOUT MACHINERY—Equipment for mechanically aiding the removal of castings from molds.

SHANK—The handle attached to a small ladle.

SHIFT—A casting defect resulting from a mismatch of cope and drag.

SHOT IRON—Small globular pieces of iron formed when molten metal is spilled on the foundry floor.

(To Be Continued)



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THE FOUNDRY DATA SHEET MAY 1946

AFA SERVES INDUSTRY FOR 50 YEARS

(*Continued from page* 151)

was attached a uniform apprentice plan. The second recommended establishment of an organization of foundry owners.

The constitution adopted provided for annual dues of $10, $5 of which was to be remitted in case membership was held in any local foundrymen's association.

The idea of free interchange of technical and shop practice information predominated in the newly formed association and the labor problems were not prominent. The objects of the association which has been in force from the formation of the association till its incorporation in 1916 are aptly stated in the by-laws which were adopted at the time of its incorporation which are:

"The object of this association is to promote the arts and science practiced or applied by foundry operators, or others concerned in the production of castings; and to this end to hold and conduct meetings of its members for the consideration and discussion of subjects pertaining or related to the business of displays and demonstrations of useful machinery, equipment and methods; to print, publish and distribute papers, discussions and other information pertaining to the business of foundrymen; and by other lawful means to promote the technical interest of the foundry industry and the welfare of all persons therein or connected therewith."

From time to time there has been a temptation to stray to other fields of activity perhaps broader in scope yet not strictly within the bounds of the traditional field of activities.

The discussion of technical advancement has been the chief activity and any tendencies to depart from the purposes as expressed in the by-laws have been discouraged. The association has been asked to take part in industrial controversies, to establish cost consultant services and similar activities.

To define anew the purposes of the association and to help in any future decisions when confronted with propositions which border on the technical the board of directors in 1924 approved a statement of principles of practice. These principles after restating the purpose of the association as outlined in the by-laws further state:

Outlines Association Activities

"However, it is not within the activities of the association to carry out practically the results of its researches and investigations. A cost system, for example, may be recommended for adoption, but its practical installation and application are not within the scope of the association's activities. Similarly, the results of investigation of apprenticeship systems should be made known to the members and a course of training may be recommended, but its application in individual plants should be left to the foundryman or to the institutions that may adopt the apprentice system."

"It is not intended that the association engage in the compilation of so-called trade statistics, such as pig iron production, pig iron stocks—"

All partisan controversies are without the scope of the association, whether of a trade or commercial, political, religious, labor, or any similar nature. Nor is it intended that the association engage in commercial enterprises that in any way conflict with the activities of any of its members."

The principles of practice if followed out are in the judgment of the officers of the association those which will best serve the needs of the members of the association. Thus through various vicissitudes have the purposes been defined. The most important work continues today, as it was in the past to be based upon the interchange of technical information, the investigation of all problems relating to foundry operation and management. An account of some of the individual services of the association along this line may be in order.

Mr. Hoyt's history of the association also includes a discussion of the developments in technical activities, the recognition of service to the industry through the awarding of gold medals by the association, the co-operation that has developed with other technical societies in the United States, the interchange of ideas with foundry organizations of other countries, and the important features of the exhibitions of equipment and supplies staged by the association. Space does not permit the re-publication of this interesting historical material in this issue.

Ever since the early days of the association, one of its important services to the foundry has been the presentation of technical papers at the annual conventions. Activities along technical lines of course led to the foundation of technical committees to handle certain research problems, such as in connection with sand, and to prepare and publish

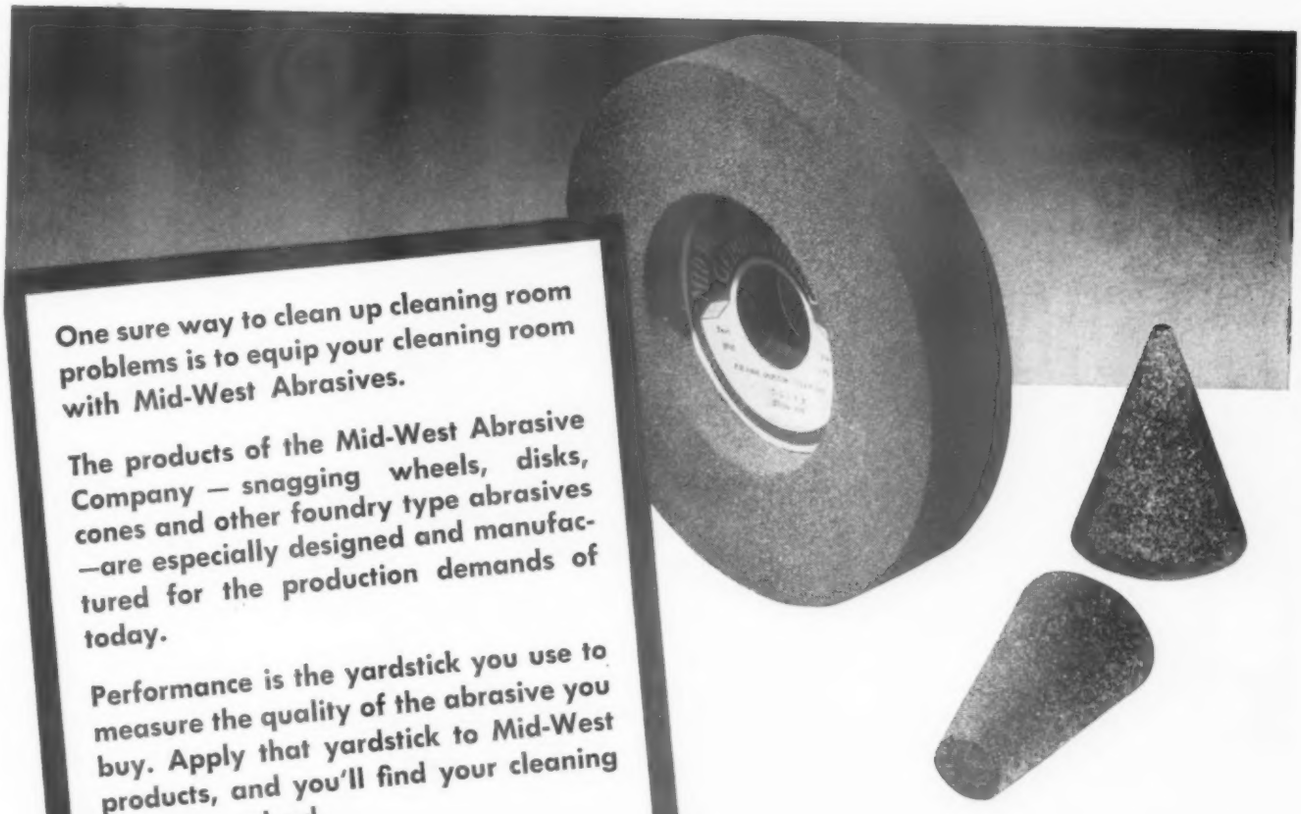
(*Continued on page* 210)

AFA Presidents, 1896-1946

Francis Schuman	1897-1898
C. S. Bell	1899
Joseph S. Seaman	1900
William A. Jones	1901
J. S. Sadlier	1902
A. W. Walker	1903
Willis Brown	1904
Chris J. Wolff	1905
Thomas D. West	1906
W. H. McFadden	1907
Stanley J. Flagg Jr.	1908
L. L. Anthes	1909
Arthur T. Waterfall	1910
Maj. J. T. Speer	1911-1912
Henry D. Miles	1913
Alfred E. Howell	1914
Maj. R. A. Bull	1915-1916
J. P. Pero	1917
Benjamin D. Fuller	1918
A. O. Backert	1919
Carl S. Koch	1920
Wyndam R. Bean	1921-1922
C. R. Messinger	1923
Guilliam H. Clamer	1924
Louis W. Olson	1925
A. B. Root Jr.	1926
S. Wells Utley	1927-1928
Samuel T. Johnston	1929
Fred Erb	1930
N. K. B. Patch	1931
Egbert H. Ballard	1932
Thomas S. Hammond	1933
Frank J. Lanahan	1934
Dan M. Avey	1935-1936
James L. Wick	1937
Hyman Bornstein	1938
Marshall Post	1939
Henry S. Washburn	1940
Lester N. Shannon	1941
Herbert S. Simpson	1942
Duncan P. Forbes	1943
Lee C. Wilson	1944
Ralph J. Teetor	1945
Fred J. Walls	1946

Sites of AFA Conventions

Philadelphia	1896
Detroit	1897
Cincinnati	1898
Pittsburgh	1899
Chicago	1900
Buffalo	1901
Boston	1902
Milwaukee	1903
Indianapolis	1904
New York	1905
Cleveland	1906
Philadelphia	1907
Toronto	1908
Cincinnati	1909
Detroit	1910
Pittsburgh	1911
Buffalo	1912
Chicago	1913
Chicago	1914
Atlantic City	1915
Cleveland	1916
Boston	1917
Milwaukee	1918
Philadelphia	1919
Columbus	1920
No Meeting	1921
Rochester	1922
Cleveland	1923
Milwaukee	1924
Syracuse	1925
Detroit	1926
Chicago	1927
Philadelphia	1928
Chicago	1929
Cleveland	1930
Chicago	1931
Detroit	1932
Chicago	1933
Philadelphia	1934
Toronto	1935
Detroit	1936
Milwaukee	1937
Cleveland	1938
Cincinnati	1939
Chicago	1940
New York	1941
Cleveland	1942
St. Louis	1943
Buffalo	1944
No Meeting	1945
Cleveland	1946



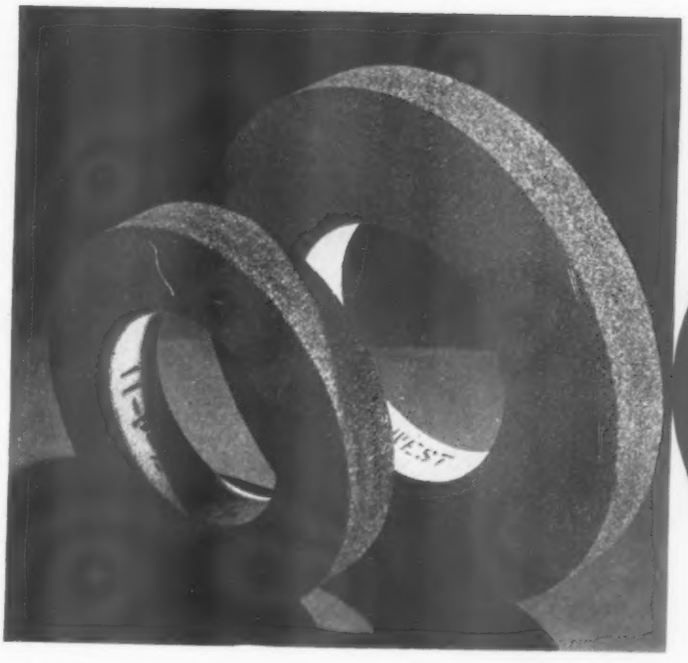
One sure way to clean up cleaning room problems is to equip your cleaning room with Mid-West Abrasives.

The products of the Mid-West Abrasive Company — snagging wheels, disks, cones and other foundry type abrasives —are especially designed and manufactured for the production demands of today.

Performance is the yardstick you use to measure the quality of the abrasive you buy. Apply that yardstick to Mid-West products, and you'll find your cleaning problems solved.

Switch to Mid-West today!

CLEAN UP WITH MID-WEST ABRASIVES



MID-WEST ABRASIVE CO.

Manufacturers of DEPENDABLE Abrasives

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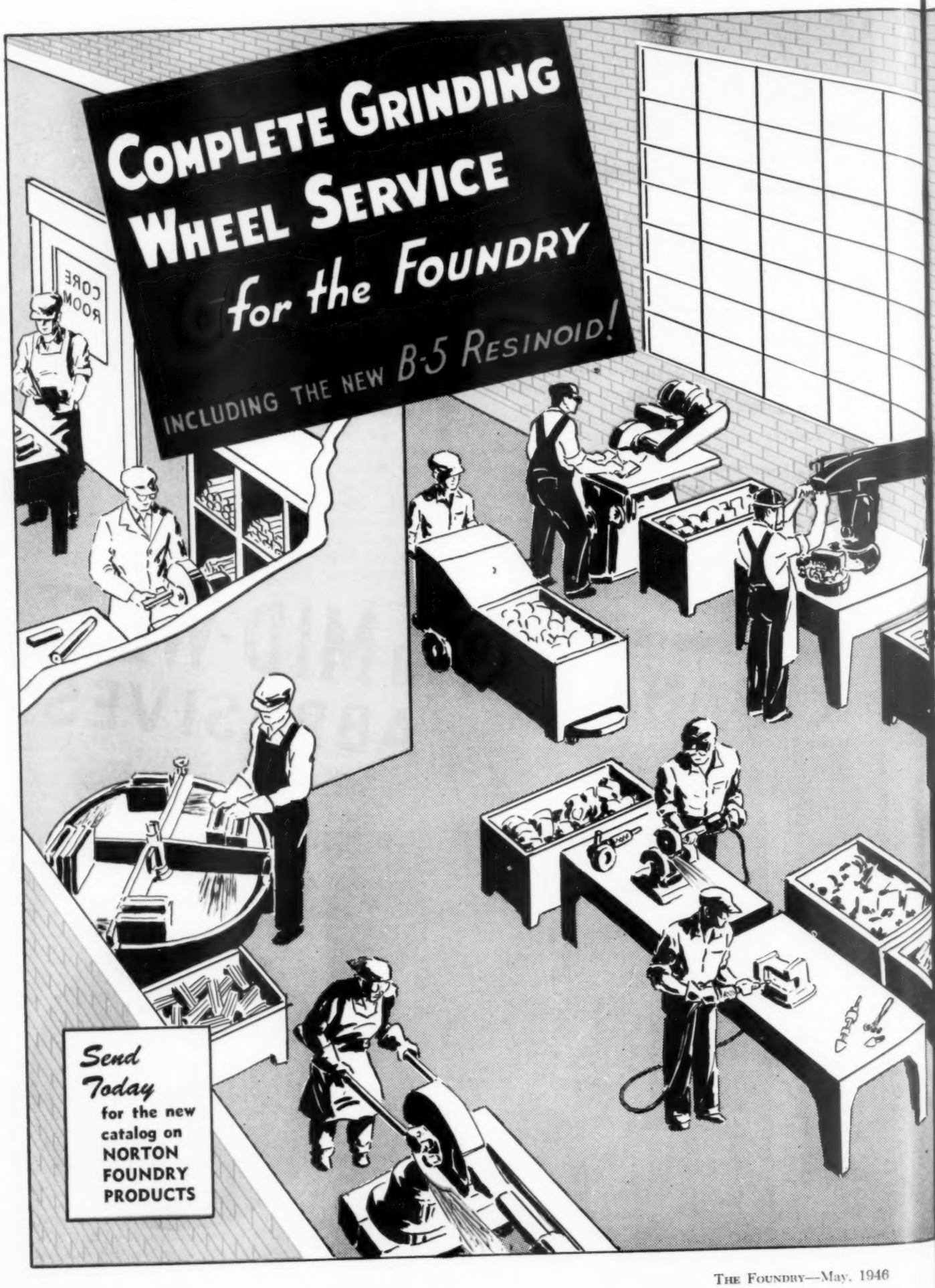
ROCHESTER, PA.


COMPLETE GRINDING WHEEL SERVICE for the FOUNDRY
INCLUDING THE NEW B-5 RESINOID!
CORE ROOM
Send Today for the new catalog on NORTON FOUNDRY PRODUCTS

OUTSTANDING records are being made in foundry after foundry by the new Norton B-5 Resinoid wheel. Operators like its fast, smooth cutting action—management the economy of its long life.

In the tables below B-5 recommendations are given for high speed grinders and for disc grinders and vitrified bonded for slow speed grinders.

SWING FRAME GRINDERS

	High Speed 6600-9500 s. f. p. m.	*Slow Speed* 4000-6500 s. f. p. m.
Steel and Annealed Malleable Castings	A123-P4B5	15A14-Q5VBE 0115 Treated
Gray Iron and Unannealed Malleable	37C14-Q4B5	37C14-R5V 0115 Treated

FLOOR STANDS

Steel and Annealed Malleable Castings	57A16-04B5	15A16-P5VBE 0115 Treated
Gray Iron and Unannealed Malleable	37C14-Q4B5	37C14-R5V 0115 Treated
Brass, Magnesium and Aluminum Castings	37C16-P4B5 #12 Treated	37C16-Q5V #12 Treated

PORTABLE GRINDERS

Steel and Annealed Malleable Castings	57A16-Q4B5	A24-P5VBE
Gray Iron and Unannealed Malleable	37C14-Q4B5	37C16-Q5V
Brass, Magnesium and Aluminum	37C16-Q4B5 #12 Treated	37C16-P5V

All recommendations in tables above based on medium pressure and contact using 16" to 24" wheels on swing frames and floor stands and 6" to 8" straight or cup wheels on portable grinders.

DISC GRINDERS

Steel Castings (roughing)	57A16-K5B5
Steel Castings (finishing)	57A46-J5B5
Annealed Malleable Iron	57A16-L5B5-E141
Gray Iron (large, heavy work)	37C14-L5B5
Gray Iron (small work)	37C24-K5B5
Aluminum Castings (small)	37C30-J5B5 #12 Tr.
Brass and Bronze Castings	37C20-M5B5

CUTTING GATES AND RISERS

Norton wheels for foundry cut-off machines have been laboratory developed for their special job — wheel balance, thickness variation and warping are controlled within very narrow limits.

Aluminum and Brass Castings	A24-U6R-30
Steel and Bronze Castings	A24-T6R-29 or A245-Q5B-K

MOUNTED POINTS AND MOUNTED WHEELS

For cleaning castings in the hard-to-get-at places there's a complete line of Norton Mounted Points and Wheels — made of Alundum or Crystolon abrasive, vitrified or resinoid bond.

IN THE CORE ROOM

For smoothing and shaping sand cores there are Norton Core Files — made of hard, sharp Crystolon abrasive, resinoid bonded and reinforced with a strip of steel.

For quickly cutting stock cores to length there are Norton Cut-off Wheels — suggested specification 37C24-N8B-K.

The various recommendations given here may be used as a general guide in selecting wheels but individual conditions may, of course, necessitate some modifications. A Norton abrasive engineer will be glad to study conditions in your cleaning room and make specific recommendations.

NORTON COMPANY, WORCESTER 6, MASS.

Distributors in All Principal Cities

W-1051

Watch for B-7

NORTON ABRASIVES

MAN-TO-MAN on the Molder's Bench

"The Try-O-Meter"

By RALPH L. LEE

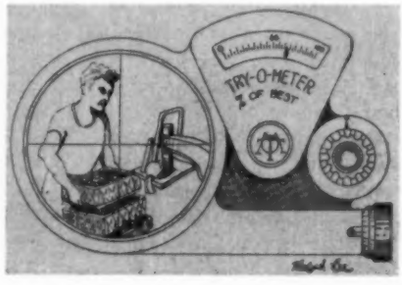
FOR several days I worked on the molder's bench beside him. He was molding a big open-work and springy pattern on the floor. While I am not a good enough molder to judge, it seemed to me he was going about his work in a sort of cumbersome way and somewhat on the slow side. He had quite a lot of patching to do and, in a way, I was glad for he showed me some patching tricks I had never seen before.

When the boss saw me trying out one of these tricks, he shook his head and made me dump out my flask and start over again. He said if I had done the job right in the first place I wouldn't have to be messing around with that kind of patching.

Later I learned through the grapevine that while my neighbor had been a molder all his life and he was far from being a spring chicken, he had never quite cleared that difficult hump which separates mine-run molders from top-notchers. In spite of this, he had managed somehow to hold a job and had never been out of work for very long.

In thinking about this fellow and a lot more like him I have learned to know, it struck me there weren't many foundries, or any other kinds of business for that matter, which could carry on for long without these square pegs in round holes who don't seem to get very far in spite of their trying.

Of course, I think there will never be anyone besides God and the fellow doing the trying who will know exactly how much trying is actually being done. But I do think anyone will agree that with a given amount of trying some get a darned sight farther than others. Take, for instance, a poor kid born into this world without an ear for music. He can be forced to practice every day until the cows come home, only to be left miles behind by some



other seemingly lazy kid who was born with clefts, sharps and flats flowing through his veins.

All of which seems to prove that all men are not born equal as far as the market value of their services is concerned. Babe Ruths, Bing Crosbys, Einsteins, Tom Edisons and General Eisenhowers come few and far between, while folks like my molder friend and me are a dime a dozen as far as the supply is concerned.

But on the other hand, if we compare people on the basis of the extent to which they try to do the very best they can with what they've got, regardless of talents or lack of them, all men *are* equal for no one, not even God himself, can ask for more from any man.

On this basis, the lowliest Negro shakeup man who tries as hard as he can to do his job as he sees it and sticks to it, in spite of the heat and the dust and in spite of the everlasting monotony of it, is entitled, as a fellow human being, to the same respect as the manager of his foundry who in the same degree within *his* power does all *he* can with what *he's* got.

I wish there were an instrument, something on the order of an optical pyrometer, which we could focus on these mine-run people and measure accurately just how hard they are really trying to do their jobs. I expect we would find some powerfully respectable people scattered among them, and by the same token we might be in for somewhat of a jolt when we pointed it at some of the boys hovering near or on the top.

In looking through THE FOUNDRY ads, I haven't found any of these Try-O-Meters, nor have I seen anything in the reading matter about one being developed. Maybe I'll have to start working on the project myself.

In the meantime, I guess we'll have to go around suspecting everyone of trying harder than we thought they were. I don't think it would hurt a bit as an experiment to start paying out in advance a little more respect than we have been handing out in the past, even though we find out later that some don't deserve it.

If we try this experiment, I am sure that one thing is bound to happen. That Carrying - the - Weight-of-the-Nation Look, or that Lost-in-Deep-Thought-Executive Look is likely to disappear from the faces of some of our foundry bosses, and consciousness of rank won't seem quite as rank to the rank-and-file as it has in the past. Who can tell, maybe the by-product of this experiment might turn out to be more production and less scrap (both kinds). In any event, the experiment won't cost very much.

(*Continued from page* 206)

reports. These association reports include such recent publications as *Foundry Sand Testing Handbook, Recommended Practice for the Sand Casting of Nonferrous Alloys, Alloy Cast Irons, Modern Core Practices and Theories, Cast Metals Handbook*, and numerous others. A report of the Cupola Research Committee will be published shortly as the *Cupola Handbook*. Various problems connected with plant housekeeping have been handled in codes developed by the Committee on Safety and Hygiene. During the war that committee prepared codes for the protection of foundries against air raids.

Exhibits of foundry equipment and supplies have provided the focal point of greatest attention at many annual conventions. The first exhibit was staged at the second annual convention, held in Detroit, in 1897. An entire floor of Harmonie Hall was set aside, under direction of a committee, for the exhibition of equipment and supplies, with a total of 56 exhibition spaces available. In 1946,

(*Concluded on page* 212)

CROWN HILL SEACOAL

always means:

HIGH QUALITY.....

QUICK FLASH.....

LOW SULPHUR....

QUICK VENTING...

TRIFLING ASH (FUSION POINT OF THIS RESIDUE IS 2980° F.)

LOW CLEANING COSTS

SOMETHING TO INTEREST YOU
... SEE US AT THE SHOW ...
BOOTH 812

HE FEDERAL FOUNDRY SUPPLY COMPANY

4600 East 71st Street • Cleveland 5, Ohio

Seacoal Plant
OWN HILL, W. VA. • CHICAGO • CHATTANOOGA, TENN • DETROIT • MILWAUKEE • NEW YORK • ST. LOUIS • RICHMOND, VA. • Mines UPTON, WYO.

IN TWIN CITIES: The Foundry Supply Co., Inc., 2295 University Ave., St. Paul 4, Minn. IN SOUTHWEST: Beaumont Cement Sales Co., Houston & Beaumont, Texas, and Harvey, La.

(*Concluded from page* 210)

at Cleveland, exhibitors will total in excess of 250. The association conducted exhibitions intermittently for a while, and then a separate company was organized to conduct the exhibits. In 1916, the association again took over the staging of exhibitions, and at that time the organization was incorporated and a charter was obtained from the State of Illinois.

A complete list of conventions of the association is presented in an accompanying table. During the last 10 years, exhibitions have been held in conjunction with the following conventions: Detroit, 1936; Milwaukee, 1937; Cleveland, 1938; Chicago, 1940; Cleveland, 1942; Buffalo, 1944; and Cleveland, 1946.

The first chapter of the association was organized in Chicago in 1934, and the following year seven chapters were formed, in the order named: Northeastern Ohio, Quad City, Philadelphia, St Louis, Detroit, Wisconsin and Northern California. A list of the 32 chapters now functioning under the AFA banner and the dates of organization, are given in an accompanying table. The chapter movement has provided a tremendous stimulant for association growth. In the 12 years since the Chicago Chapter was formed the membership in the association has quadrupled.

Over a period of 50 years, thousands of men have served their industry through association activity. A list of the men who have been honored by the association through election to the presidency is shown in an accompanying table. But behind the men are the committee members, the authors of papers, chapter officers, and the exhibitors of equipment and supplies. All of these, under the guidance of the men and women of the headquarters staff, have expended much in the way of money to further progress in the science of making castings. Their contributions have made it possible for the American Foundrymen's Association to serve the foundry successfully for fifty years.

Chapter Organization Dates

1. Chicago, May 3, 1934
2. Northeastern Ohio, Mar. 5, 1935
3. Quad-City, May 20, 1935
4. Philadelphia, June 12, 1935
5. St. Louis, Oct. 10, 1935
6. Detroit, Oct. 17, 1935
7. Wisconsin, Nov. 8, 1935
8. Northern California, Nov. 15, 1935
9. Birmingham, Feb. 27, 1936
10. Metropolitan, Jan. 17, 1937
11. Southern California, Apr. 21, 1937
12. Western New York, Apr. 28, 1937
13. Northern Ill.-Southern Wis., Sept. 13, 1938
14. Ontario, Sept. 30, 1938
15. Cincinnati District, Jan. 13, 1939
16. Michiana, Jan. 18, 1939
17. Central New York, Feb. 10, 1939
18. Central Indiana, Dec. 4, 1939
19. Chesapeake, Nov. 15, 1940
20. Western Michigan, Mar. 3, 1941
21. Twin City, May 26, 1941
22. Toledo, Dec. 5, 1941
23. Eastern Canada-Newfoundland, Apr. 16, 1942
24. Rochester, Nov. 10, 1943
25. Texas, Nov. 26, 1943
26. Canton, Mar. 30, 1944
27. Central Ohio, Dec. 20, 1944
28. Oregon, Jan. 19, 1945
29. Saginaw Valley, May 3, 1945
30. Northwestern Pa., June 25, 1945
31. Mexico City, Oct. 6, 1945
32. Central Illinois, Dec. 17, 1945

COLORADO'S OLDEST FOUNDRY

By FRANK G. STEINEBACH

AROUND the middle of March, the Editor spent several days in Colorado speaking before the Rocky Mountain Chapter of the American Society for Metals, at Pueblo and Denver. On one nice afternoon he was taken on a most enjoyable tour of the mountains just west of Denver by Curtis C. Drake, manager of the Denver plant of the Griffin Wheel Co.

The trip included many canyons and a visit to the old gold mining town of Central City, Colo., located nearly 8000 ft above sea level. This town, which had its first settlers in 1860, has had a most interesting history, and recently has had certain sections restored, including the old Opera House where summer opera now is held under the auspices of the University of Denver.

About a block above the Opera House, an old building bears a sign giving the following information:

Oldest Foundry and Machine Shop in Colorado
1861—Built by Hendrie and Butler
1864—Enlarged and taken over by Hendrie Bros.
1873—Incorporated as Hendrie Bros. and Bolthoff
1878—Incorporated with Denver Branch of Hendrie Bros. and Bolthoff who moved to Denver
1879—Sold this foundry to McFarlane & Co.
1892—McFarlane & Co. established a large shop in Denver
Peter McFarlane & Sons operated this plant until 1912.

Mr. Drake and the Editor found remains of the old foundry in the back, and while the roof had fallen in years ago, the cupola was still standing as is shown in the accompanying illustrations. Evidently the cupola above the charging door had been pushed to one side when the roof fell in.

The bottom doors were dropped, but the last heat back in 1912 evidently was not too successful because the cupola was frozen up.

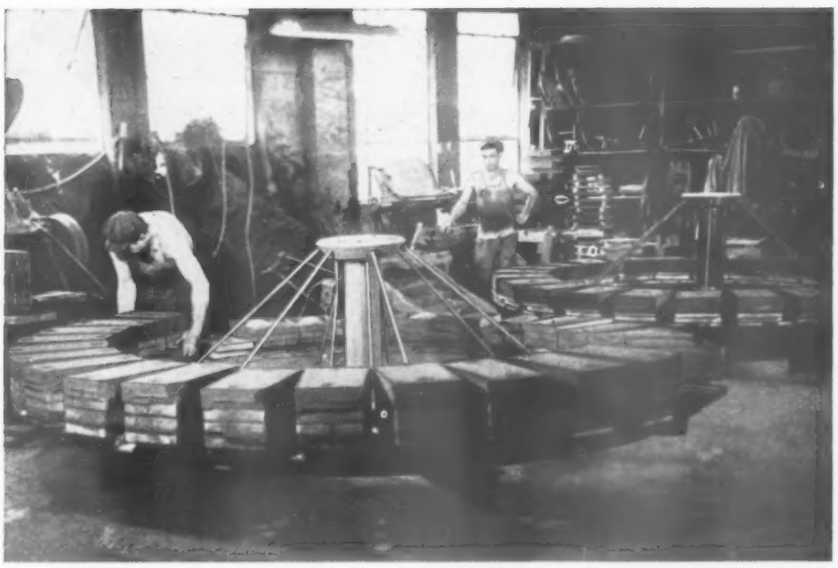
The explorers found the old core oven, with just enough of the roof remaining to indicate the arch. Further search revealed an old pattern, an old flask, small piles of molding sand, rusty gaggers and other evidences of a foundry since a small annealing pit was found. The shop evidently made mine car wheels for the gold mines that at one time honeycombed the mountain.

Some of the foundrymen in Denver are thinking about restoring this old foundry as a museum.

The Editor inspects the cupola at abandoned plant in Central City, Colo., the state's first foundry. Built in 1861, it has been idle since 1912

Flour City Ornamental Iron Co., Minneapolis, plans construction of a one-story plant, 300 x 339 ft.

ROTO-CAST *Revolving Mold Conveyor for Nonferrous Foundries*



Increases mold production . . . saves labor . . . reduces handling time . . . Speeds output . . . Comes ready for quick, easy installation . . . !

★

3 Sizes

ROTO-CAST is made in three standard sizes: 10-ft., 12-ft., and 14-ft. diameters.

Full roller-bearing construction for easy turning. When desired, release of ratchet makes free-wheeling. Can be rotated with one finger even when fully loaded No motors or other operating cost.

★

* Designed by foundrymen under actual working conditions, ROTO-CAST conveyors are in use in representative foundries . . . have proven their unusual merit and efficiency.

Easy to assemble and install, the unit sets on the floor without the necessity of anchoring, thus giving full flexibility. It is placed just back of each molder who simply turns around, places his mold on the conveyor, then steps on a trip ratchet release . . . spring arrangement revolving ROTO-CAST to position for receiving the next mold.

Pouring may be done from one spot as the unit is revolved and stopped positively for the pour. Shake-out is at one spot with molds simply picked off and dumped as machine is revolved. Its low cost will surprise you.

WRITE FOR FOLDER "F" FOR FURTHER DETAILS

ROTO-CAST *Foundry Equipment, Inc.*

COLDWATER, MICHIGAN, U. S. A.

INTERESTED IN

SAND

PREPARATION?

SEE US AT THE FOUNDRY SHOW

MEMBER

FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION, INC.

CLEARFIELD
MACHINE COMPANY

CLEARFIELD
PENNSYLVANIA, U. S. A.

NEW ENGLAND FOUNDRYMEN

Meet in Two-Day Conference

By WILLIAM G. GUDE
Associate Editor
THE FOUNDRY

RESUMPTION of the New England Foundry Conferences after a wartime lapse of four years attracted a registration of more than 400 to the two-day program comprising the sixth of these conferences, held at the Massachusetts Institute of Technology, Cambridge, Mass., Mar. 29-30. Four technical sessions—which included a well-balanced and well-received group of 11 papers—the annual conference dinner on the first evening, and a smoker, dinner and entertainment at the conclusion of the conference, made up the program.

As in past years, various New England foundry groups co-operated in sponsorship of the event. These included, in addition to the Massachusetts Institute of Technology, the New England Foundrymen's Association, Boston Chapter of the Non-Ferrous Founders' Society, Connecticut Foundrymen's Association, Connecticut Non-Ferrous Foundrymen's Association and the American Foundrymen's Association.

Merton A. Hosmer, Hunt-Spiller Mfg. Corp., South Boston, Mass., vice chairman of the conference, presided at the opening session and introduced Dr. Edward L. Moreland, dean of engineering, M.I.T., who, in his address of welcome, stressed the importance of closer contact between industry and educational institutions. R. F. Harrington, Hunt-Spiller Mfg. Corp., served as chairman of the ensuing technical session.

Trained Welders Needed

Discussing "Repair Welding of Castings," Vincent T. Malcolm, director of research, Chapman Valve Mfg. Co., Indian Orchard, Mass., emphasized the need for trained welding operators, particularly in the production of weldments. Considerable progress has been made in the welding art, he pointed out, and inspection methods are useful for determining the quality of welds, but the availability of skilled operators still is the most important consideration.

Mr. Malcolm described in considerable detail the procedure in manufacture of large steel valves for high temperature, high pressure applications, involving the assembly of components by welding. Importance of proper preheating in such welding was stressed.

In a paper on "Cleaning of Castings," Fred Mosley, Whitehead Bros. Co., Providence, R. I., discussed factors affecting the efficiency of various types of blast cleaning equipment. In the induction or gravity feed type the nozzle should not be larger than three times the diameter of the air jet. In the positive pressure type, with the air and abrasive flowing through the nozzle, a 50 per cent increase in nozzle diameter as the result of wear cuts efficiency to 45 per cent and may waste as much as 10,000 cu ft of air per hour.

While the abrasive stream of the centrifugal type blasting wheel cannot be directed normally to the work as readily as a compressed air nozzle, this unit will throw a larger amount of abrasive per consumed horsepower than the latter.

Mr. Mosley pointed out that no blast cleaning unit can work properly without the necessary ventilating equipment. Likewise, the most efficient blast operation and sanitary conditions prevail when the abrasive is clean—free from sand and dust. In subsequent discussion the speaker indicated that a good average consumption rate of abrasive is 8 lb of shot or grit per ton of castings.

Various factors comprise a good radiograph, it was stated by Dr. John T. Norton, M.I.T., in a talk on "Radiographic Inspection of Castings." These include proper exposure; proper sharpness that permits recognition of defects and location of the smallest defects; proper contrast between defects and the background, and proper latitude (range of thickness in the part). Generally it is necessary to compromise between contrast and latitude.

Thicknesses of casting sections that x-ray machines of various capacities will penerate were given as follows: 50 to 150 kv—3 in. of aluminum, ¾-in. of steel, ½-in. of bronze; 150 to 150 kv—6 in. of aluminum, 2½ in. of steel, 2 in. of bronze; 200 to 400 kv—3½ in. of steel, 3 in. of bronze; 1000 kv—8 in. of steel or bronze; 2000 kv—12 in. of steel or bronze; 10,000 to 20,000 kv—20 in. of steel or bronze. Radium may be used on steel or bronze sections up to 6 in.

Dr. Norton explained that different types of films have varying characteristics, the faster films having coarse grain and providing poorer contrast than fine-grain film, but the latter is a slower type.

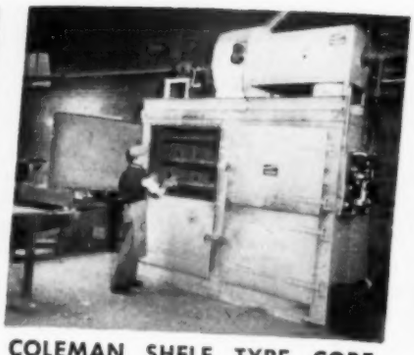
The speaker recommended standardization of technique in x-raying castings and an industry-wide classification of types of imperfections revealed in radiographs. He also predicted increased use of x-ray in the foundry, particularly as an aid in perfecting casting design and operating practice.

The second session was opened with the Luman S. Brown Lecture, given in memory of the late president of the Springfield Facing Co., Springfield, Mass., by George H. Reama, vice president of manufacturing and director of labor relations, the American Screw Co., Providence, R. I. The speaker was introduced by E. H. Ballard. In his paper on "Can We Continue the System of Free Enterprise?" Mr. Reama pre-

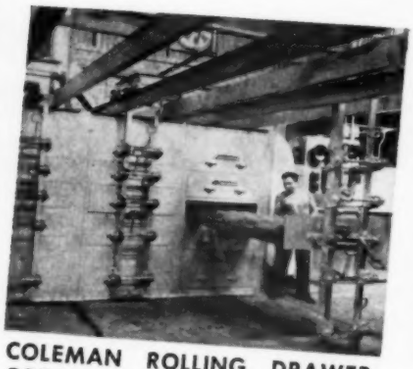
(*Continued on page* 218)

Some of the committee members active in arrangements for the successful Sixth New England Regional Foundry Conference held at Cambridge, Mass.

COLEMAN OVENS



COLEMAN SHELF TYPE CORE OVENS. For limited production of small or medium cores. Available with gas or oil-fired recirculating heating systems.



COLEMAN ROLLING DRAWER CORE OVENS. For larger production of small and medium cores. Available in a wide range of sizes and capacities.

COLEMAN TRANSRACK CORE OVENS. For operation with portable racks to reduce handling. Single or multiple rack capacity per compartment.

Conventional types and specially engineered installations for every requirement!

When you choose a Coleman Oven you profit by experience which includes over 40 years of specialization in designing and building foundry ovens, and more than 9,000 successful installations of all types.

Coleman Ovens are famous for *fast, perfect baking with less fuel and less labor.* They have proved of amazing value in every class of foundry work—gray iron, malleable, steel, alloy, aluminum, magnesium, etc.

Coleman Ovens are built in all types and sizes to best meet each and every operating requirement. An investigation of Coleman Core and Mold Ovens to meet your own needs may disclose outstanding cost-cutting possibilities.

Perfect baking is guaranteed with all fuels. Coleman Ovens may be operated with any "automatic" fuel such as gas, oil, electricity, powdered or stoker coal, etc., whichever is most economical to obtain in your district.

Write for Folio of Coleman Oven Bulletins

WORLD'S OLDEST AND LARGEST FOUNDRY OVE

COLEMAN CORE *and* MOLD OVENS

***The* FOUNDRY E**

CLEVELAND 13 O

BUILDERS OF COLEMAN A

The Most Complete Line of Foundry Ovens Built!

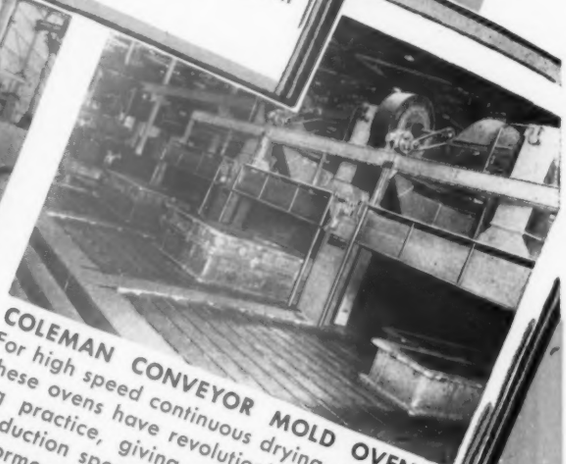
COLEMAN CAR TYPE OVENS. For baking large cores or drying molds. Most of the large core and mold ovens in operation in every class of foundry production are Coleman Car Type Ovens.

COLEMAN TOWER CORE OVENS. For high speed production at lowest labor cost. Patented Center Passageway permits loading from inside and outside the Tower to provide maximum accessibility and loading speed.

COLEMAN HORIZ. OVERHEAD CONVEYOR CORE OVENS. For production departments employing large number of coremakers on such work as automotive, agricultural, etc., this design offers certain special advantages.

More than **9,000** *Successful Installations*

COLEMAN HORIZ. FLIGHT CONVEYOR OVENS. For redrying cores and core assemblies after pasting, blacking or washing. Available in a wide range of sizes and capacities.



COLEMAN CONVEYOR MOLD OVENS. For high speed continuous drying of molds. These ovens have revolutionized mold drying practice, giving amazingly increased production speed at a fraction of the cost of former methods.

OVEN SPECIALISTS

EQUIPMENT Company

OHIO, U. S. A.

MEMBER

AND SWARTWOUT OVENS

(*Continued from page* 215)

dicted that the system will save itself but that the next few years will determine if we can keep it. A requisite is attainment of an equitable economic balance between customer, worker and business owner. Much of the recent labor strife he attributed to the fact that neither government nor industry had a postwar wage policy; but the unions did.

At the succeeding technical session, over which Dr. R. S. Williams, head, department of metallurgy, M.I.T., presided, Lester B. Knight, Lester B. Knight Associates, Chicago, discussed "Modernization of the Foundry." Emphasizing that plant modernization frequently can be effected without extensive mechanization, Mr. Knight cited various means of providing improved efficiency and economy in foundry operations. Complete text of his paper appeared in THE FOUNDRY for April.

"Melting of Bronze," the subject of a discussion by W. B. George, R. Lavin & Sons, Chicago, was supplemented by a description of an economical method for removing risers from manganese bronze castings. As explained by the speaker, this material passes through a brittle range while cooling from the molten state. While within this range—marked by a pink color in appearance of the metal—risers are readily removed by a blow from a sledge hammer. The operation is simplified by narrowing a small section of the riser with use of a thin core.

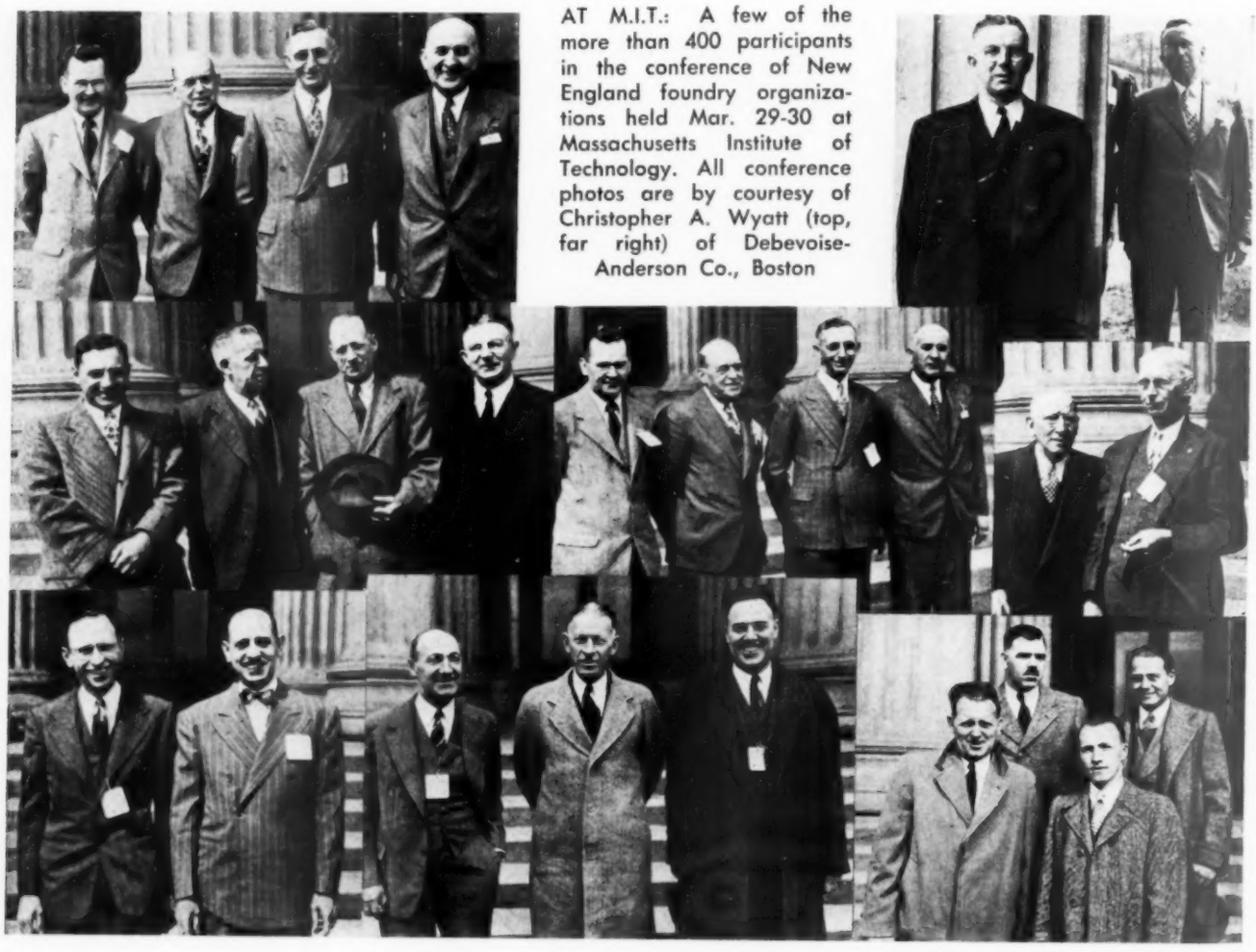
In discussing tin bronzes, Mr. George emphasized that soundness and strength of such castings depend on rapid solidification, thereby making the use of chills frequently necessary. Both the rate and direction of solidification are factors that must be considered in making bronze castings.

Dr. Walter M. Saunders Jr., consulting metallurgist, Providence, R. I., and chairman of the committee on conference arrangements, presided at the conference dinner Friday evening at which talks were given by Dr. Karl T. Compton, president of M. I. T., and Frank G. Steinebach, editor of THE FOUNDRY. Dr. Compton described the institute's wartime activities, particularly the radiation laboratory where several thousand persons were engaged in the development of radar devices for the armed forces. In speaking of a study of Japanese industry in which he participated shortly after V-J Day, Dr. Compton stated that the Jap's inability to get into volume production quickly on new or improved design of weapons and other military equipment was an important factor in their defeat. Contrary to common belief, he declared, various instances were noted of ingenuity and originality in product design in Japan.

Mr. Steinebach first discussed influences which were brought to bear upon the foundry industry during the war and their effect in the years ahead. He stressed progress made by the steel casting industry as a result of its efforts in Washington to demonstrate the availability of cast steel for war materials, and stated that many of the difficulties of the early war period might have been avoided if producers of gray iron and malleable iron had been equally progressive in this regard.

Mr. Steinebach then outlined the lessons that foundrymen should have learned during the war. He stated that future success of the foundry industry demands the co-operative efforts of all types of foundries. Out of the war came the firm conviction that castings are basic engineering materials in almost all types of products. A realization of their importance has at last become firmly fixed in the minds of foundrymen.

(*Continued on page* 220)



AT M.I.T.: A few of the more than 400 participants in the conference of New England foundry organizations held Mar. 29-30 at Massachusetts Institute of Technology. All conference photos are by courtesy of Christopher A. Wyatt (top, far right) of Debevoise-Anderson Co., Boston

Mathews

TROLLEY CONVEYERS

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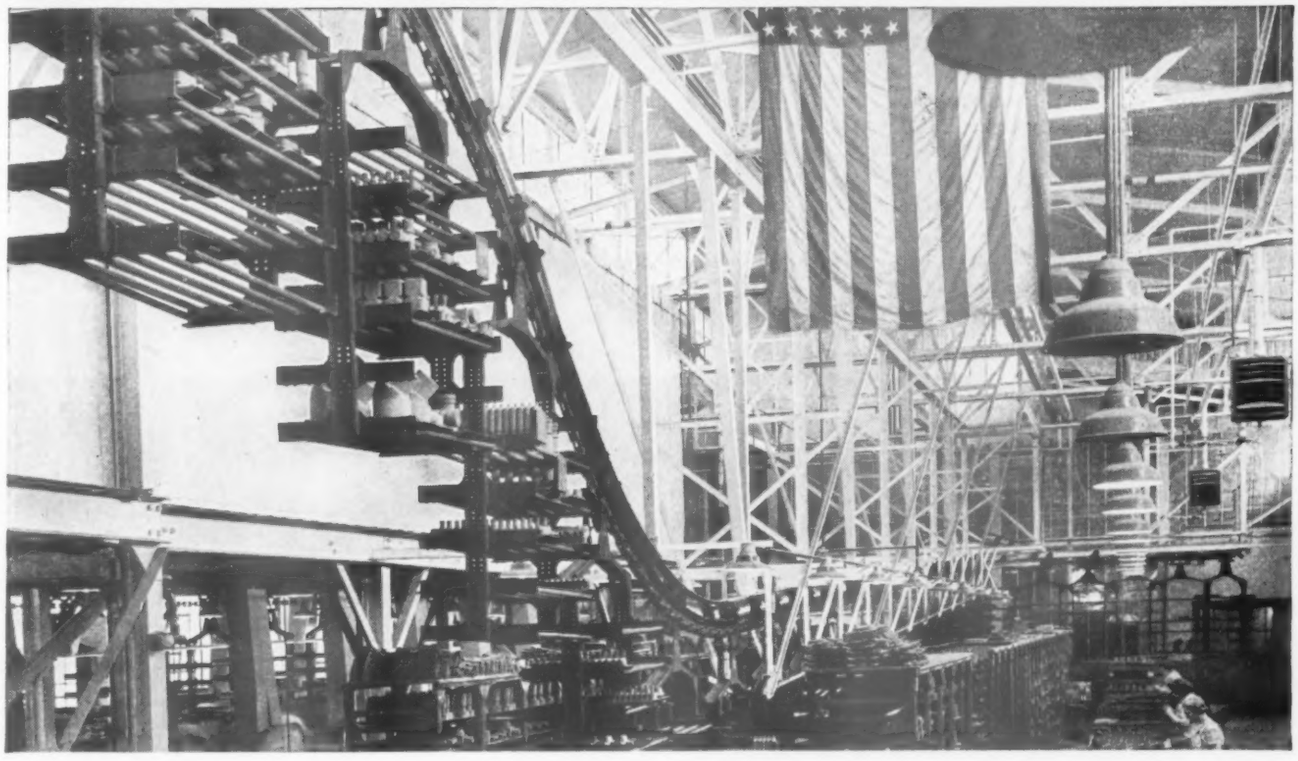


Trolley Conveyers are being applied in modern foundries for handling materials, usually cores and castings, through Production Departments, from one building to another, and in many other ways are operating to serve production. Transverse bends lower the loads to working height, keeping a continuous flow of materials reaching the working area. The conveyers do their work without occupying valuable floor and aisle space. They can serve one or several floor levels, and can be applied inside or outside the buildings. Variable speed drives make possible the exact control of the material reaching the working areas and the many types of hangers available add to the flexibility of the conveyers. Mathews Trolley Conveyers, like other prominent Mathews types for foundry application, are on the job today in many of the nation's great foundries. A Mathews Engineer operates in your vicinity, and would appreciate an opportunity to help you with that conveying problem.

Mathews Conveyer Company

ELLWOOD CITY, PENNSYLVANIA

(*Continued from page* 218)

The speaker concluded by mentioning factors which should be given special consideration by the industry. Research, increased attention to good housekeeping and modernization, the interesting of young men in foundry careers and customer relations are important factors, he indicated. Other foundry needs include better cost control, elimination of price cutting, production of a uniform product, greater technical control and the increased use of production knowledge already available. The foundry industry may look forward to the future with confidence if the technical developments of the war years are used to advantage in producing castings for an economy of peace, he declared.

Speaking at the third technical session, presided over by Thomas R. Walker Jr., Warren Pipe Co. of Massachusetts, Everett, Mass., Charles Schureman, F. E. Schundler & Co., Joliet, Ill., gave a comprehensive and instructive review of the various factors which can lead to trouble in the selection, preparation and use of foundry sands. In synthetic sand practice selection of the base sand and the bonding material should be determined by the class of work to be done, he pointed out. If fine sand is required, it cannot be attained by a mixture of coarse-grain and ultra fine sands. The fineness number means nothing unless distribution of the grain sizes is known.

Mr. Schureman recommended use of the muller for successful mixing of sand. For steel and some gray iron foundry sands the proper procedure is to start with dry sand, add water, mix, and then add the bonding materials. Many foundries encounter sand troubles which are traceable to carelessness in measuring ingredients, he asserted. Neither the wheelbarrow nor the shovel is an accurate measuring device, and metal containers which have lost their original shape can be equally faulty.

"Put an intelligent, high-class, well-paid man on the sand mixer; set up the right program of sand mixtures; weigh and measure ingredients accurately, and mix for the proper length of time," the speaker urged. Drying is the important consideration in coremaking, according to Mr. Schureman, who stated that no foundry dries all its cores long enough.

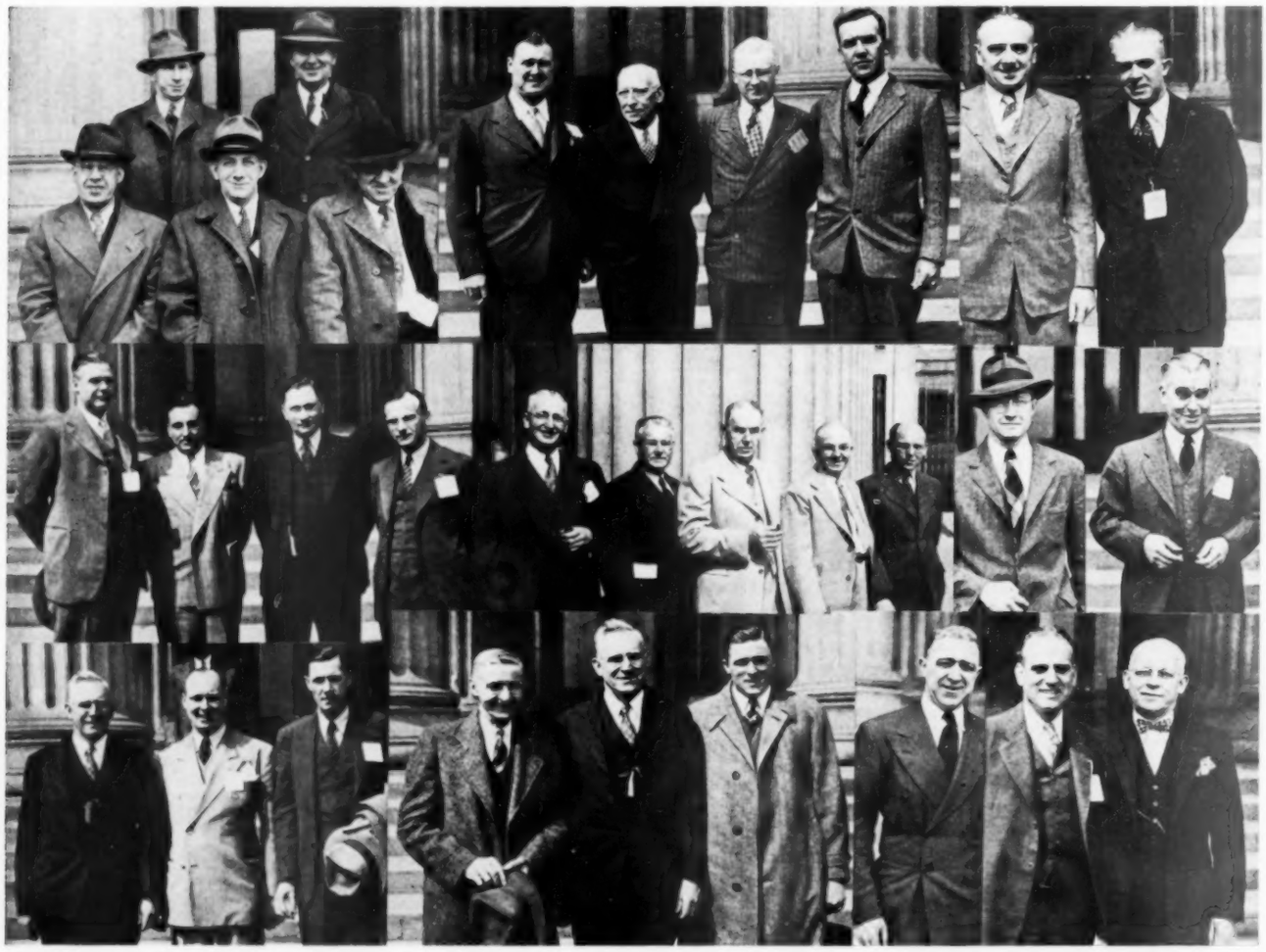
Problems of the melting department of a small gray iron foundry were discussed by Donald J. Reese, International Nickel Co. Inc., New York. His talk covered such phases as equipment, raw materials, operating technique, chemistry, metallurgy, ladle treatments, metal distribution, pouring temperature and pouring rates. In connection with cupola operation, Mr. Reese emphasized the importance of weight and particle size of intermediate coke charges, pointing out that they determine temperature in the cupola and that coke plays a part in the metallurgy of cast iron.

Size of materials in the metal charges likewise should be suitable, he stated, recommending that the maximum dimension (including the diagonal) of any piece be not more than 30 per cent of the cupola diameter. In metal charging, steel scrap should go first, foundry returns next and pig iron last.

Metal should accumulate at the tap hole 8½ minutes after the wind goes on, and tapping should be at uniform intervals throughout the melt. It is desirable to effect transfer of metal from cupola well to ladle in 15 to 30 seconds, rather than in 60 to 120 or more seconds.

The concluding technical session had

(*Concluded on page* 222)



Additional views of New England foundrymen who attended the first regional foundry conference held since 1941

FIRST TIME EVER SHOWN!

Houghton presents "ELECTRONICS IN THE CORE ROOM"

DRY-BINDER CORES BAKED OUT IN MINUTES BY DIELECTRIC HEATING

A new principle—electronic baking of cores—will be demonstrated at the Houghton Booth, using Induction Heating Corporation's new conveyorized dielectric core oven and Hy-Ten Dry Core Binder.

This sensational new development, which will attract thousands, promises to end a bottleneck familiar to every foundry—the baking oven. While still in the experimental stage, this modern adaptation of dielectric heat to core baking may mark a great forward step in foundry practice. As an indication of the time saved, standard tensile strength cores bake out thoroughly in thirty (30) seconds. Only a thermo-setting resin-type binder will permit that speed.

This project is now in actual foundry production, where it shows early advantages of absolute control of time and temperature, uniform heating, no odor or smoke, and improved handling on a production basis.

See it for yourself at Booth 433, Fiftieth Anniversary Foundry Exposition. E. F. HOUGHTON & CO., 303 W. Lehigh Ave., Philadelphia 33, Pa.

HY-TEN CORE OILS

For today's production, Houghton offers modern, proven core oils which serve best the time-honored practice of oven-baked-and-cured cores.

These are the new "polythermic" type of oils which are given thermo-setting properties, so that cores bake through completely. Shake-out is improved, baking temperatures reduced, less smoking or gassing.

For today's production, use HY-TEN—in five types for every purpose and purse.

DON'T MISS BOOTH *433* - THERMONIC DIELECTRIC HEATING with HY-TEN DRY CORE BINDER

(*Concluded from page* 220)

A. S. Wright, Hunt-Spiller Mfg. Corp., as chairman. In discussing casting defects peculiar to gray iron, George Johnstone, Cooper-Bessemer Corp., Grove City, Pa., decried the tolerant attitude in many cases of management and staff toward what is regarded as a normal amount of defective castings, and the accompanying lack of interest in attempting to reduce such losses.

The scrap problem is essentially a management problem, he asserted, and one which, to be solved, imposes the following responsibilities: Provision of a suitable place for men to work; supply of correct working equipment and materials; education and supervision of men in correct techniques and methods of working

Mr. Johnstone stated that casting defects normally involve one or more of the following: Metal, molding, cores, pouring, cleaning, pattern equipment, design. Slides were shown to illustrate examples of defects resulting from various of these classifications. The speaker emphasized the importance of careful inspection of castings not only to prevent defective castings from leaving the foundry, but also to supply details of all defects which will assist in formulating measures to correct causes of the imperfections

Howard F. Taylor, on leave from the Naval Research Laboratory, Washington, and now at Massachusetts Institute of Technology, presented the last paper of the conference, his subject being "Gating and Risering." Mr. Taylor described the basic theory of controlled directional solidification in casting steel, indicated how this can be applied to nonferrous castings, and explained briefly the complications that develop in connection with gating gray iron.

Mr. Taylor stated that controlled directional solidification requires having the coldest metal within the feeding range of a given feeder at a point farthest from the riser, with the metal progressively hotter toward the riser at all times during solidification. This ideal situation will provide maximum benefit from feed heads and produce the soundest possible casting. The speaker then described the effect of atmospheric pressure on foundry techniques, and indicated the principle can be used to great advantage in feeding castings. Atmospheric pressure, a force equal to approximately 14.7 psi, acts equally on all parts of the casting, and it has been carefully determined that a sand mold is permeable enough to permit this condition. As the casting solidifies and the metal contracts, there is a tendency for a partial vacuum to form within the casting. If liquid contact is made at all times with the riser and progressive solidification is maintained, atmospheric pressure will move the liquid metal in to fill the shrink. If the feeding is not adequate a shrinkage cavity will form somewhere in the casting.

Mr. Taylor explained the use of blind risers in making steel castings. He then discussed in detail the work which was done at the Naval Research Laboratory on the use of insulating pads and riser sleeves for producing sound bronze castings. An extensive report on this subject was published in the October and November, 1945, issues of THE FOUNDRY.

Concluding event of the conference was a smoker held Saturday evening at the Parker House Roof, Boston, under the auspices of the foundry equipment and supplies vendors. The committee in charge of arrangements included Ray Hunter, chairman, Harry Impey, Frank Kumer, Hugh Johnston, William Slater, Paul Trook, Jack Orrock and Charles Reid.

REGIONAL CONFERENCE

Held by Michigan Foundry Groups

By PAT DWYER
Engineering Editor
THE FOUNDRY

MICHIGAN foundry conferences suspended during the war years were resumed Friday and Saturday, April 5 and 6, at Michigan State College, East Lansing, Mich., where in addition to the college, Engineering Department, the meeting was sponsored by four chapters of the American Foundrymen's Association, viz: Detroit, Michiana, Saginaw Valley and Western Michigan.

The entire technical program was presented in the R. E. Olds Engineering building, one of an extensive group of buildings scattered over an exceptionally attractive campus covering more than a square mile of area and dating back to the establishment of this first land grant college in 1857. In antiquity and venerable appearance the establishment may not approach some of the European schools, but continual growth and expansion, continual care and upkeep of the grounds and buildings for a period of nearly a century have conferred a generous portion of the peculiar form of glamour that comes only with age. The auditorium in the Engineering School, with tiers of seats sharply banked, is exceptionally well adapted to holding any kind of a meeting.

Instead of the somewhat usual system of holding four or more sessions simultaneously, the program was arranged in a straight line with continued sessions of an hour devoted to each item on the agenda. In this manner the program was divided into two morning and two afternoon sessions with each chairman of the four participating chapters serving as chairman for one session. M. H. Surls, Clark Equipment Co., Buchanan, Mich., presided Friday morning; J. F. Smith, Chevrolet Gray Iron, Saginaw, Friday afternoon; E. C. Hoenicke, Eaton Mfg. Co., Detroit, Saturday morning; J. Wesley Lee, Challenge Machinery Co., Grand Haven, Mich., Saturday afternoon.

At the dinner, entertainment was supplied by Prof. J. G. Hays, Dairy Department. "Military Government Experiences in The Pacific" was discussed by Sam Street Hughes, former mayor of Lansing and lieutenant-commander in the United States Navy.

Formal address of welcome was presented by C. C. DeWitt, of Michigan State College. He was introduced by M. H. Surls, formerly a member of the college staff and for the past several years connected with Clark Equipment Co., Buchanan, Mich. Mr. DeWitt welcomed the members, assured them of the full co-operation of the engineering department and congratulated them upon a resumption of the annual conference program which had been suspended during the war years.

The first paper, presented by Harry W. Dietert, H. W. Dietert Co., Detroit, directed attention to the value and the actual need of close technical and practical control in the foundry. He described testing equipment and methods and the manner of application of all the recognized scientific apparatus now available. This reference naturally suggested pattern design and construction and the important part played by these items in the promotion of directional solidification and the prevention of many forms of casting defects. The speaker ranged over a wide field and introduced instances to show how the adoption of close control methods, or a tightening up of methods already in use was reflected directly in production, better product, reduction in scrap loss and consequent better financial showing. Incidentally better housekeeping naturally accompanied a control program and tended toward improved morale and general peace and harmony between employes and management.

W. A. Morey, formerly captain in

(*Continued on page* 224)

BAYFLEX...a new Bay State development

THE AMAZINGLY SAFER CUT-OFF WHEEL

The New Bayflex Wheels, incorporating cotton fibres in abrasive bonding, are Bay State's answer to the demand for cut-off wheels that combine *greater safety* with *faster, freer* cutting action and minimize the operator's fear of wheel breakage.

Greater safety results from the increased toughness and balanced flexibility of an entirely new bonding material. And in addition to providing fast cutting, this balanced flexibility permits side grinding and close following of contours with the danger of wheel breakage greatly reduced — an amazingly safer wheel.

Already, in many foundries and other metalworking plants, these advanced wheels are setting new performance records in cutting-off non-ferrous metals. Write for recommendations on how the new safe-operating, time-saving Bayflex Wheels can benefit *your* production.

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(*Continued from page* 222)

Chicago Ordnance District, in a paper entitled "Precision Castings," stated that precision casting is a somewhat abused term often employed to designate the lost wax investment casting process. To at least some extent the inclusion of the word *precision* is improper since like other processes the lost wax investment casting process will yield precision results only in proportion to the care exercised in the execution of the work. Properly, precision casting should mean just exactly what the term implies and should not be employed to designate any specific process. The speaker presented a detailed description of the investment process. Under proper conditions investment castings may be held within tolerances of 0.003-in. The process has a definite field. The speaker presented a comparison of the advantages and disadvantages of each of the so-called precision casting methods. With the investment process the cost of production is high and the process is limited to the production of castings not exceeding 1/2-lb.

Restricted To Low Temperature

Plaster mold casting offers attractive features, particularly with copper-base alloys. The initial die or pattern cost is reasonably low. The method is not so well adapted to the production of aluminum and magnesium castings. Metals with melting temperatures over 1900 F. cannot be cast satisfactorily in plaster molds.

The die casting process imparts an excellent surface and close tolerance if the volume is large. The process is not particularly applicable where only a limited number of castings are required or where certain physical properties are specified. The initial die cost is high, the size is somewhat limited and in some instances porosity is quite troublesome.

The permanent mold process offers the best characteristics in the nonferrous alloys and can handle medium size castings at a reasonably low cost. The surface finish in many instances is not sufficiently smooth. Recent advances in the art indicate that much better shape and tolerance control may be expected in the near future.

Characteristics of the centrifugal process vary considerably, depending on the type of mold and upon whether the mold is swung about an internal or external axis. Development work on all these processes points in the direction of greater precision and better surface at lower costs.

Relative effect of lime and dolomite fluxes on cupola irons and cupola operation was discussed in a paper prepared by H. Womochel and C. Sigerfoos, M. S. C., and presented by H. Womochel. Following quotations from several published dissertations on the same subject, the authors described the investigation conducted in the foundry connected with the engineering department. The general procedure was to run successive pairs of heats identical in every particular with the exception that one was fluxed with lime and the others with dolomite. A complete record was kept of all pertinent features. These results were presented in a series of slides. In a summing up of results it was indicated that limestone is not inferior to dolomite in desulphurizing ability. No difference could be detected between the appearance or viscosity of lime and dolomite slags. Substitution of dolomite for limestone does not change the carbon, phosphorus, or manganese content of the iron. Neither does it change the physical properties and microstructure.

In a discussion of the present and future status of the malleable iron industry, Carl Joseph, Saginaw Malleable Iron Division, Saginaw, Mich., stated that contrary to what formerly was the case, the malleable casting industry really is coming through in wonderful shape and making real progress. In melting, the trend in recent years has been toward duplexing with the cupola as the melting medium and the air furnace or electric furnace as the holding unit. This may be regarded as the first step in the mechanization of a plant and a stimulant in good housekeeping.

Another recent development is composite molding where two or more patterns are grouped in a single mold. The pattern plate may be in one piece or in sections so that if necessary any section may be removed and replaced by another. Several slides were shown to illustrate the molding and pouring of molds in 3 x 6 ft flasks. A group of castings from one of these molds weighed 900 lb. Other recent improvements noted by the speaker included over and under molding, where two castings with a core between are produced in one mold; a gate pad which eliminates the gate core, leaves no gate scar, and reduces the snagging operation.

Portable ovens equipped with radiant tubes are being installed gradually. The covers are shifted from hearth to hearth. Electric ovens in which the loaded car is raised and lowered have been installed in several plants. Radiant tube, atmosphere controlled furnaces of the continuous type are used widely for tonnage production on small castings. The speaker also touched upon other features—gate shearing, material handling, working conditions, better methods and inspection.

Howard F. Taylor, studying at Massachusetts Institute of Technology while on leave from Naval Research Laboratory, presented a lively, fluent and interesting description of the principle underlying the feeding of castings and the application of atmospheric pressure to force the metal from the feeding riser into the casting. Molten metal is liquid and while in that state is subject to the universal laws of pressure and gravity. In passing through the liquid to the solid state solidification begins on the outside of the casting in contact with the wall of the mold and progresses toward the center. With the frozen shell steadily growing thicker and with gravity pulling the liquid metal downward as well as toward the center the casting eventually will develop a void in the center unless a method is adopted to supply additional liquid metal from an outside source. In a method developed by the Dodge Steel Co., Philadelphia, a round, dry sand core imbedded in the sand and extending into the riser a distance roughly equal to the radius of the riser supplies the necessary atmospheric pressure. For full description of the process see article in THE FOUNDRY for August and October, 1942.

Attract Foundry Workers

A paper on the subject of attracting and holding foundry workers was presented by Fred Walls, International Nickel Co., and president of the American Foundrymen's Association. Among the items suggested for attracting boys to the foundry industry the speaker included co-operation with the grade and high schools, with churches, Boy Scouts and other organizations, engineering colleges, regional meetings and special committees in the AFL chapters. The second part of the problem, how to hold the young workers, is the more difficult of the two. Working conditions must be improved. Mechanization is needed to eliminate the drudgery. It is necessary to re-establish the old pride of accomplishment philosophy. The job is an obligation of supervision, management and the public. Management can improve labor relations and morale through proper foreman training programs. Glamorizing of industries, occupations and professions play an important part in guiding youth.

In discussing the part played by college in the training of foundry engineers, H. B. Dirks, dean of engineering, M. S. C., pointed out that much of what a young man can do will not be found in books, will not be told him by his professors, but will be achieved only through the exercise of his own ingenuity and initiative. Quoting from *Education by Forgetting*, by Irving W. Jones, the speaker stated, "There is one that is most appropriate to this discussion. It says 'Education is what you have left after

(*Concluded on page* 226)

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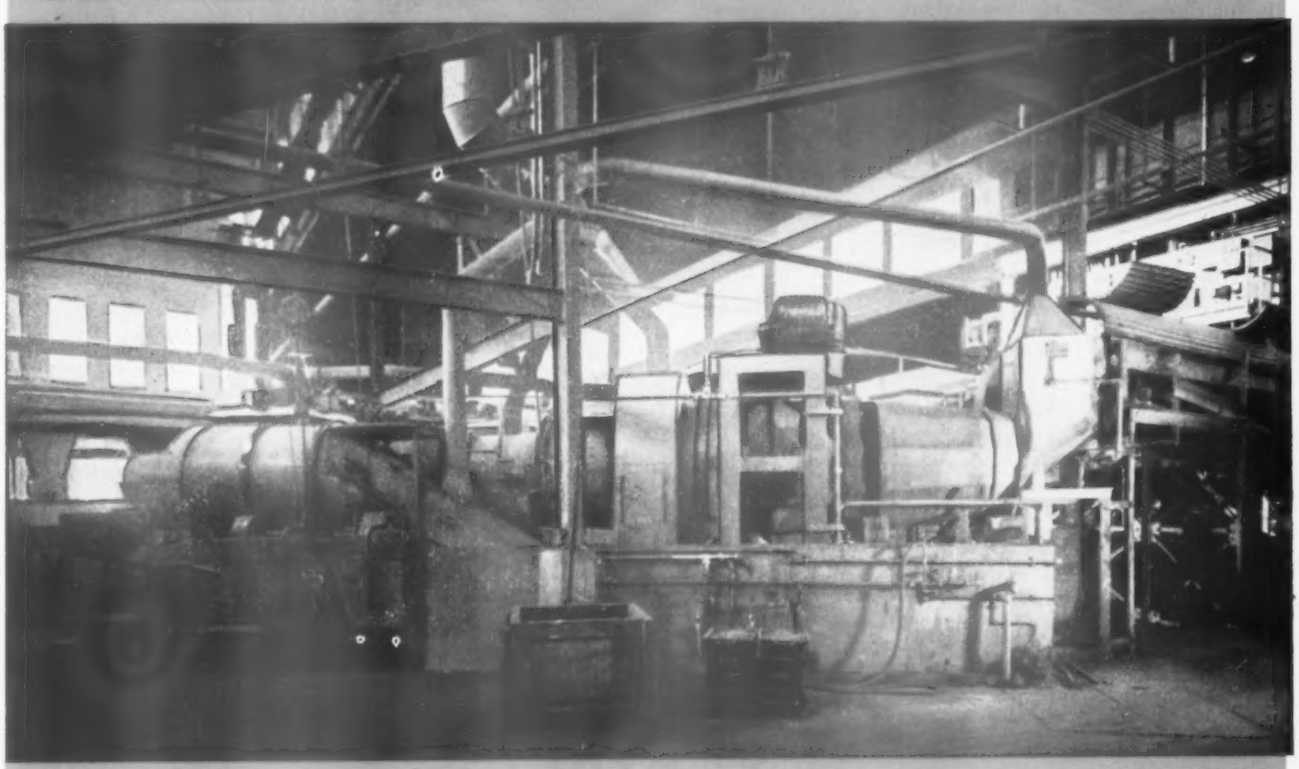

N. Ransohoff, Inc.

TOWNSHIP AVE. & BIG 4 RR, CINCINNATI 16, OHIO

MEMBER

(*Concluded from page* 224)

you have forgotten what you have learned.'" At first glance one might think that this was a joke, that someone was trying to be humorous or facetious about a subject that ran the risk of being too serious, or of being taken too seriously. In reality its meaning is deeper and more significant and is worth consideration.

The subject of foundry health hazards was covered extensively by Dr. Markuson, director, Bureau of Industrial Health, Michigan Department of Health. The casting of magnesium base alloys was discussed by M. E. Brooks, the Dow Chemical Co., Bay City, Mich. On account of the extremely light weight and other characteristics, the melting, pouring and other features in the production of magnesium casting differ to a considerable extent from the foundry technique observed in foundries engaged in the production of other nonferrous metals. The speaker traced the history of developments in the production and use of magnesium, with particular reference to the most modern methods.

Skilled Men Needed

F. C. Riecks, Ford Motor Co., Dearborn, Mich., presented a paper on modern trends in pattern rigging for production molding. Highly skilled men familiar with foundry practice are needed whether patterns are to be used constantly or only a limited number of times, or only once. Wood patterns serve satisfactorily for occasional use, but metal patterns are needed where the service is constant. Illustrations and descriptions showed how pattern and molding machine equipment was developed to meet production requirements in the Ford Co. foundries. Pattern and machine form a team. Pattern and corebox form a team. New days call for new methods.

A talk by Professor O. W. Boston, chairman of the Department of Metal Processing, University of Michigan, Ann Arbor, Mich., covered the extensive wartime research program of the War Production Board sponsored by the Office of Production Research and Development. Two programs were carried out, one at the California Institute of Technology dealing with the problems of milling steel and aluminum with sintered carbide cutters; the second at the University of Michigan under Prof. Boston's supervision dealing with the milling of cast iron and ferrous alloys with cutters of high speed steel, cast nonferrous alloy and sintered carbide tools.

Nature of the wear of tools was studied and standards of tool life determined. Influence of cutting speed, depth of cut, feed per tooth, and tool angles when milling various types of iron and steel was illustrated by slides. It was shown how these results could be adapted to factory production to increase the productivity of present equipment or to design new tools and equipment for more economical production.

The last paper on the program, "Effect of the Mold on Cavity Defects in Gray Iron Castings," prepared by C. C. Sigerfoos and H. Womochel, M.S.C., and presented by Mr. Womochel, does not record the complete investigation. It is a progress report. Studies covered the effect of mold hardness, green compressive strength, permeability, moisture and sea coal on piping tendencies of 1.2 x 8 in. test bars poured in green and dried molds. Later the same routine was observed with steel castings. Results show that piping, internal shrinkage and sinking of the cope face may be correlated with dimensional changes in the mold cavity, high moisture, high green compressive strength, soft ramming and unfavorable grain distribution of the sand.

The program was prepared by a committee including C. C. Sigerfoos, Michigan State College; chairman J. F. Smith, Saginaw Chapter; M. F. Surls, Michiana Chapter; Fred Wagner, Detroit Chapter; R. W. Hathaway, Western Michigan Chapter; H. Womochel and Dean H. B. Dirks, Michigan State College, East Lansing, Mich.

AFA TO HONOR FIVE MEMBERS FOR ACTIVITIES

(*Concluded from page* 147)

member of various AFA technical committees. A member of the Chesapeake Chapter, he was elected president of that group last year.

* * *

Peter Blackwood was born in Scotland and received his formal education in metallurgy, metallography, foundry practice, chemistry, mining and geology at the Royal Technical College of Glasgow. Upon entering industry he obtained broad experience in blast furnace, open hearth and by-product coke operations in plants of western Scotland. Coming to North America, he extended his knowledge of metal processes to include electric furnace, converter and Brackelsberg furnace practice, both in the United States and Canada. He was superintendent of foundries at the Buick and Pontiac divisions of General Motors Corp., for 11 years. While at the Buick division he lectured on foundry practice, heat treatment and general metallurgy at the General Motors Institute of Technology. In 1936 Mr. Blackwood started the foundry of Ford Motor Co. of Canada Ltd., at Windsor, Ont., where he has conducted considerable experimental and production work on the centrifugal casting process. He is a member of the Ontario Chapter of the AFA.

* * *

Harold J. Roast, born in London, England, and graduated from the City of London College, went to Canada in 1902 and became associated with Milton Hersey Co., Montreal, as a chemist. Since that time he has maintained foundry connections which included Canada Iron Foundries, Radnor Forges, Que.; Canadian Carbonate Ltd., Montreal; Canadian Magnesite Co., Montreal and Newark, N. J.; James Robertson Co. Ltd., Montreal; National Bronze Co. Ltd., Montreal; Robert Mitchell Co. Ltd., and Canadian Bronze Co. Ltd. He became associated with Canadian Bronze in 1933 and currently is vice president of that company and its subsidiaries. He is also owner of Roast Laboratories, Montreal.

Mr. Roast has been a lecturer at McGill University, Montreal, for 18 years, in the department of metallurgy, and has contributed widely to scientific journals on technical subjects. Vice chairman of the Canadian section of the AFA before the formation of Canadian chapters, he became president of the Eastern Canada and New Foundland Chapter after its organization. He also served as chairman of the Nonferrous Division of the AFA and has been an active organizer of programs on brass and bronze at numerous AFA conventions. He represented Canada for several years on the Board of the American Institute of Metals and helped organize the Canadian Institute of Chemistry and the Association of Professional Chemists of Quebec. Mr. Roast was a national director of the AFA in 1940-1943.

* * *

William J. Coane is a native of Philadelphia, where he has spent his entire life. He was engaged 5 years as salesman and 21 years as sales manager in the Philadelphia territory of Joseph Dixon Crucible Co., Jersey City, N. J., which included Pennsylvania, south New Jersey, Delaware, Maryland, District of Columbia and Virginia. In 1912 he became associated with the Ajax Metal Co., Philadelphia, serving as second vice president for 12 years, and first vice president and sales manager since 1924. At the time of the organization of the AFA in Philadelphia in 1896, Mr. Coane was a member of the entertainment committee. He has been an active member of the association since that time. He is a member of the Philadelphia Chapter of the AFA.

"THE WHEELS OF INDUSTRY"
Easymount
It's New . . .
It's Fast . . It's Economical!
Sterling's Easymounts and Grinding Wheels offer a positive solution of the many grinding problems related to efficient sharpening of tungsten carbide tools and the rapid finishing of tools of various steels.
Sterling's Easymounts and Grinding Wheels are available in sizes to fit various types of grinders: Willeys, Sellers, Heald, Excello, Baldor, Hammond, Oliver, Delta, Prosser, Criterion, Sundstrand, Blount, and Bur-a-way.
The rigidity of the one-piece steel Easymount plus the unique method of mounting the wheel in the assembly provide much longer than usual wheel life. The spring assembly permits all-'round tension as the retaining screws are tightened and keeps them from touching the abrasive—an important safety feature.
Sterling's Easymounts can be readily applied to your setup. Write today—our engineers will gladly cooperate.
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A complete analysis is contained in this new folder, available upon request.
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THE
STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
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THE WHEELS OF INDUSTRY

Industry BRIEFS

CENTRAL Brass & Aluminum Foundry plans construction of a one-story foundry building at Clark Ave. and 22nd St., St. Louis, to cost about $35,000. The name of the company will be changed to O'Hare's Brass & Aluminum Foundry. Francis T. O'Hare is owner.

• • •

Jewell Alloy & Malleable Co. Inc., Buffalo, has been sold to Ralph T. Rycroft president of the company for the last ten years, and Ward H. Kendrick, both of Buffalo. The foundry will be operated under the name of Kencroft Malleable Co. Inc., and will continue the production of malleable and alloy castings. Mr. Rycroft will continue as president, and Mr. Kendrick will serve as vice president.

• • •

Steel foundry of the Quad-City tank arsenal, Bettendorf, Iowa, has been sold to American Steel Foundries for $1,290,000. The sale includes land, buildings and equipment of the plant operated during the war by Campbell, Wyant & Cannon Foundry Co. to manufacture tank armor. Original cost of the foundry to the government was given as $2,486,919. American Steel Foundries plans to use the plant to make steel castings and to employ about 1800 persons.

• • •

National Iron Works, San Diego, Calif., has acquired the Barth Foundry & Machine Co., that city. All machinery, equipment and key personnel will be transferred to the new plant of National Iron Works, now approaching completion in the South Bay area of San Diego. Earl F. Kenner has been appointed superintendent of the expanded foundry operations.

• • •

Damage estimated at more than $200,000 was suffered by Sexton Stove Mfg. Corp., Baltimore, when fire of undetermined origin wrecked the interior of the foundry building, Mar. 10.

• • •

Wheland Co., Chattanooga, Tenn., has expanded its foundry facilities including installation of four conveyor loops, each approximately 207 ft long, center to center. Additional melting equipment has been added and it is anticipated that ultimate production will approximate 570 tons melt per day.

• • •

H. M. Foundry Co., a new organization, has begun construction of a cement block building, 60 x 96 ft, to house a brass and aluminum foundry in Plymouth, Ind. G. Casper Haas is president and owner of the company.

• • •

Linde Air Products Co., Unit of Union Carbide & Carbon Corp., New York, has started construction of a new oxygen filling station and acetylene producing plant, on West Trade St., Charlotte, N. C. Plans also include a warehouse for distribution purposes.

• • •

Alloy Casting Co., 720 Maccabees Bldg., Detroit, has been incorporated, with $100,000 capital, by Charles F. Hough, 231 South LaSalle St., Chicago, to manufacture alloy castings.

• • •

Michigan Foundry Products Inc., 3359 Gratiot Ave., Detroit, has been incorporated, with $10,000 capital, by Clyde Bierworth, to make ferrous and nonferrous castings.

• • •

Karl Betz Foundry Co., 2001 Bristol Rd., Grand Rapids, Mich., has been incorporated by Karl Betz, and the name changed to Betz Foundry Inc.

• • •

Poor & Co., Chicago, announces sale of its Vermilion Malleable Iron Works, Hoopeston, Ill., to Deere & Co., Moline, Ill. Operation under the new management will be effective April 1.

• • •

Cheboygan Foundry & Mfg. Co. Inc., Cheboygan, Mich., has been incorporated with $40,000 capital, by Donald S. MacInnis, to do general foundry work.

• • •

Ohio Brass Co., Mansfield, O., plans construction of a one-story foundry addition, 42 x 165 ft, to cost about $50,000.

• • •

Estate Stove Co., Hamilton, O., has been acquired by Noma Electric Corp., New York, through its subsidiary, Triumph Industries Inc. Capacity of the stove company's plant will be doubled upon completion of an expansion program planned by the parent company. John A. Seubert, also president of K-D Lamp Co., Cincinnati, another Noma subsidiary, has been elected president of Estate Stove Co., succeeding David F. Kahn, who becomes chairman of the board of directors.

• • •

American Brake Shoe Co, New York, plans a $12,500,000 improvement and expansion program in addition to the $3,200,000 expenditures on plant and equipment in 1945. The program includes five foundries, consisting of a brake shoe plant, one for special iron castings, one for alloy steel and two nonferrous foundries.

• • •

Breeze Corp. Inc., Newark, N. J., has acquired the Anderson Stove Co. Inc., Anderson, Ind., manufacturers of kitchen gas ranges, and the Foundry Service Inc., Anderson, Ind., producers of stove parts and other fabrications.

• • •

Bell Foundry Co. plans construction of a new foundry building at 5310 Southern Ave., South Gate, Calif., 40 x 160 ft.

• • •

A. & R. Foundry Co. is the firm name under which Allen F. Kridler and Louis E. Allen have published a certificate that they are conducting business at 309 North California Ave., Clearwater, Calif.

• • •

Reynolds Metals Co., Richmond, Va., has formed an ingot division, with headquarters in Louisville, for the production and sale of virgin aluminum and casting alloy ingot as well as aluminum deoxiders for the steel industry.

• • •

Whiting Corp., Harvey, Ill., has opened new and larger quarters for its Pittsburgh sales office in the Pitt Bank Bldg., Fifth and Liberty avenues, Pittsburgh 22. H. E. Reynolds is manager of the Pittsburgh district office and M. M. Coston is sales engineer.

• • •

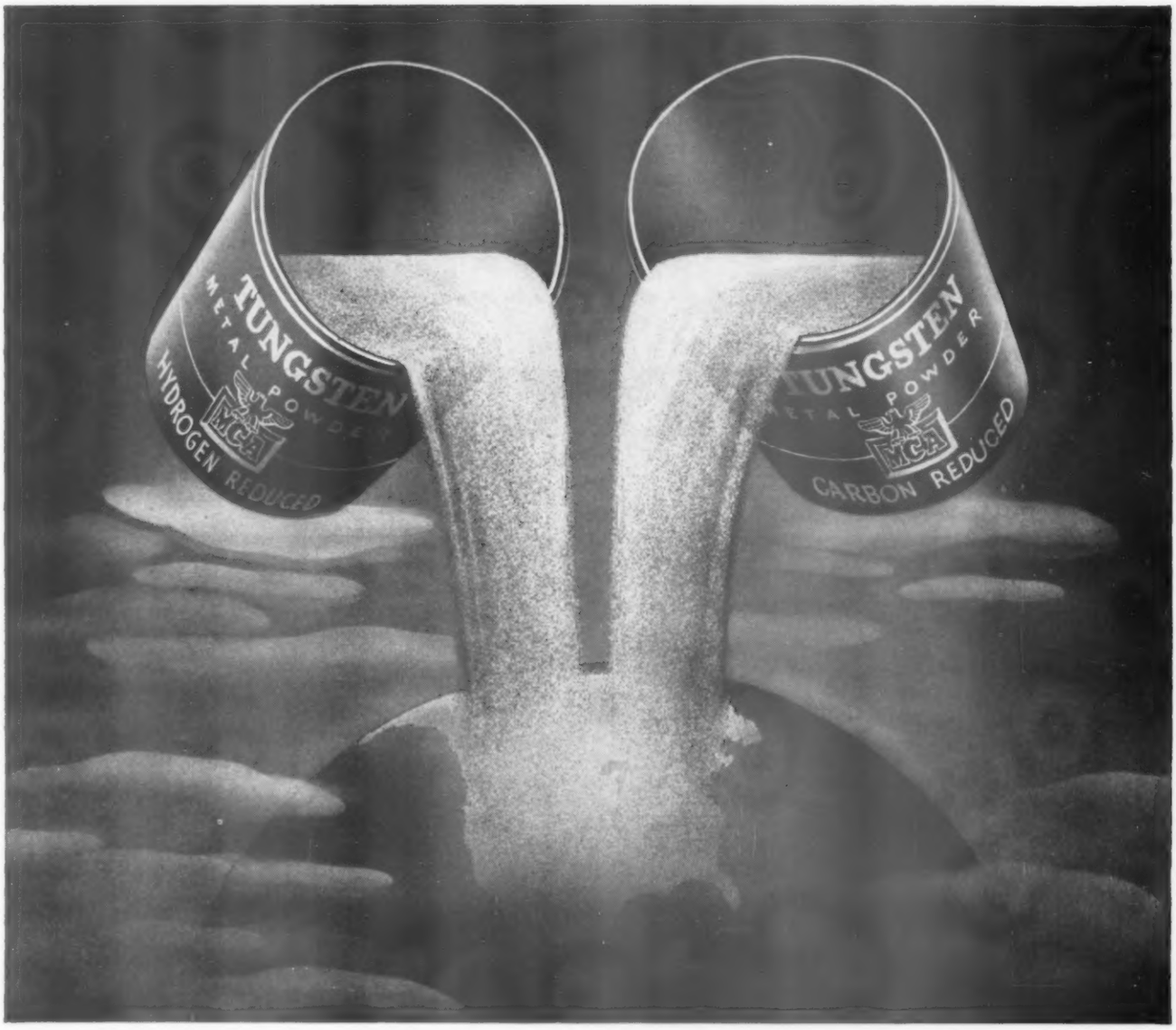
Arcee Foundry Inc., Los Angeles, has been formed, with a capital of $10,000. Directors are Arthur J. Rosamond, Leslie M. Cox and Dr. H. S. Hydanus.

• • •

Martin Castings Co., Martin, Mich., has been incorporated by Lon O. George, 1323 West North St., Kalamazoo, Mich., to manufacture castings.

• • •

Kalamazoo Steel Castings Co., Kalamazoo, Mich., has been incorporated with $350,000 capital, by Ralph M. Fisher, to manufacture castings.



TUNGSTEN METAL POWDERS FOR ALL USES

HYDROGEN-REDUCED

Hydrogen-reduced tungsten metal powder is manufactured under the most rigid control to particle sizes of 5 microns, max., for precision carbide uses, or in wider ranges to 25 microns, max., where larger size is preferred. A purity of 99.9% tungsten content is maintained.

CARBON-REDUCED

Carbon-reduced tungsten metal powder, made under very careful control, can be furnished in several screen sizes to suit, and is useful for a wide range of applications. Tungsten content is from 98.5% to 99.5% in the carbon-reduced powder.

The Molybdenum Corporation can now supply all your Tungsten requirements. Among its principal tungsten products are Ammonium Paratungstate, Tungstic Acid, Ferro-Tungsten, Tungsten Metal Powder, and Tungsten in the forms of rod and wire.

MCA products include many and various alloys and chemicals for metallurgical use. Inquiries regarding any application of Molybdenum, Tungsten, or Boron will receive careful attention.

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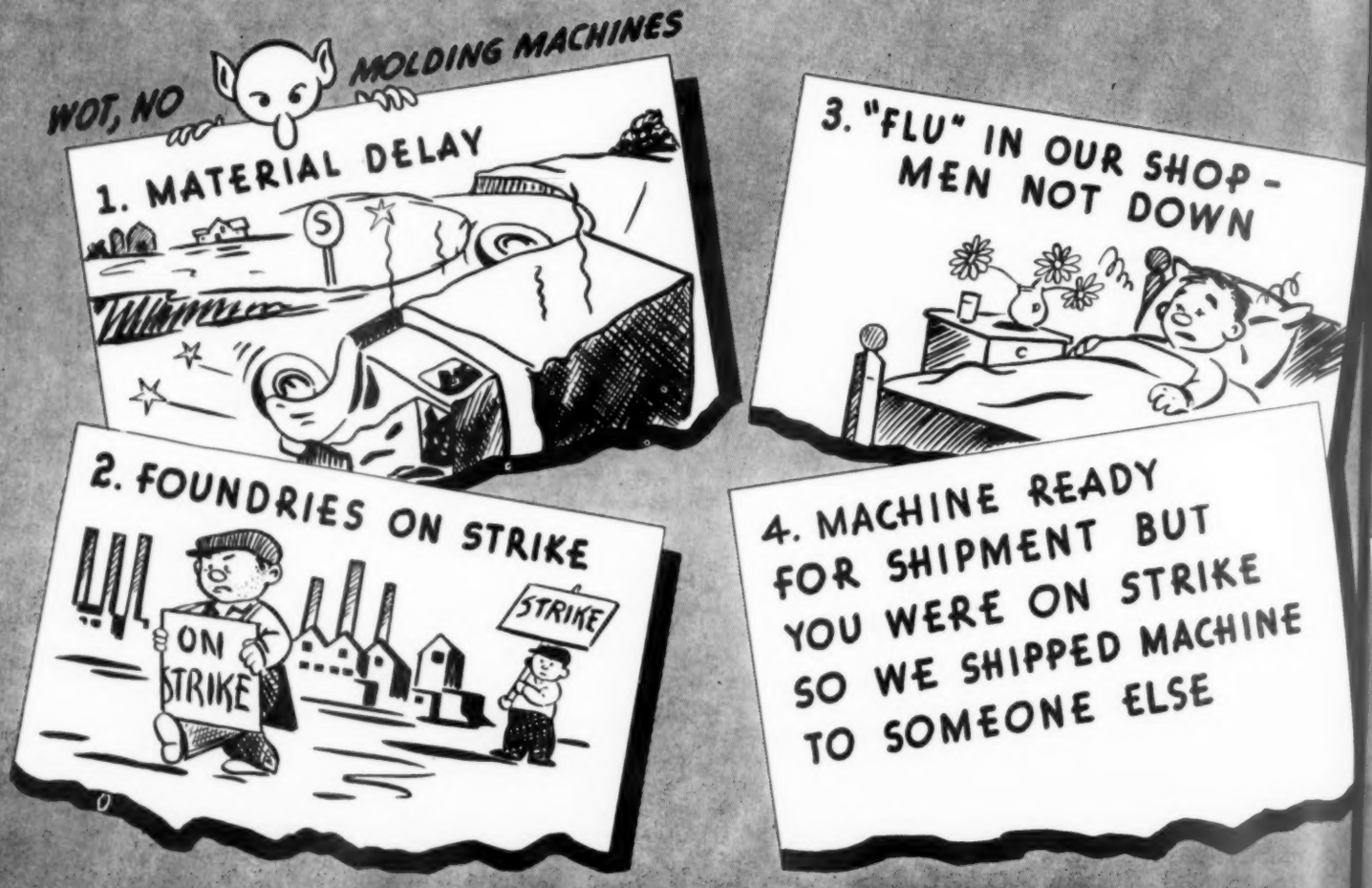
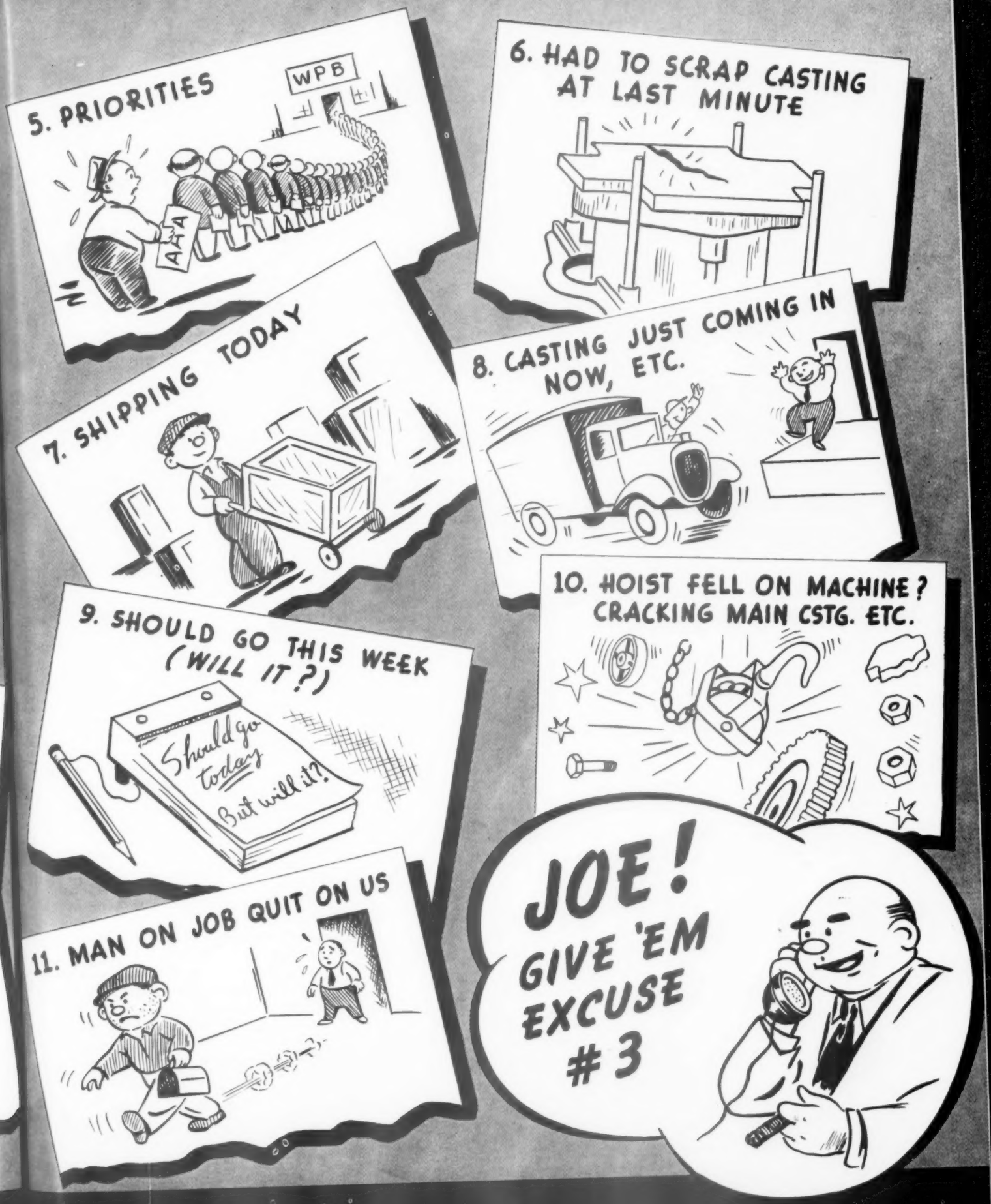
from the Pages of the

ENCYCLOPEDIA OF EXCUSES

...for Foundrymen


WOT, NO MOLDING MACHINES
1. MATERIAL DELAY
3. "FLU" IN OUR SHOP - MEN NOT DOWN
2. FOUNDRIES ON STRIKE
ON STRIKE
STRIKE
4. MACHINE READY FOR SHIPMENT BUT YOU WERE ON STRIKE SO WE SHIPPED MACHINE TO SOMEONE ELSE

INTERNATIONAL


5. PRIORITIES
WPB
AAA
6. HAD TO SCRAP CASTING AT LAST MINUTE
7. SHIPPING TODAY
8. CASTING JUST COMING IN NOW, ETC.
9. SHOULD GO THIS WEEK (WILL IT?)
Should go today
But will it?
10. HOIST FELL ON MACHINE? CRACKING MAIN CSTG. ETC.
11. MAN ON JOB QUIT ON US
JOE! GIVE 'EM EXCUSE #3

MOLDING MACHINE COMPANY
2608 WEST 16th STREET, CHICAGO 8, ILL.

MASS PRODUCTION OF PRECISION CASTINGS

(*Concluded from page* 169)

banding sand and grog (a ground refractory), are stocked on the plant's third floor, mixed on the second floor and delivered by chute to the investment department, where ethyl silicate is added in small mixers at the investment stations. The material is ladled into the flasks carefully in order not to disturb the wax pattern.

After the mold has been filled with the investment mix, it is placed on a vibrator, shown in Fig. 13, to pack the investment tightly around the pattern and to make sure that all air is removed. Within an hour the investment has set and all the fines have risen to the top. Excess investment material inside the wax paper extension of the flask then is cut off by a band saw and the mold is allowed to age for several hours. The steel bottom plate is knocked off, exposing the pouring mouth into which the metal ultimately will be poured.

At this point the completed mold contains the wax pattern assembly in the center. Next to the pattern is the fine powder facing and around the facing is the solid mold material, all encased in the metal flask.

The molds are trucked on skids to the next department, where they are placed upside down in a gas-fired furnace. Fig. 15 shows the entrance to one of the furnaces and molds being placed on grids, which are moved along by the pneumatic pusher. The heating cycle lasts several hours, during which time the molds are heated from 1300 to 1900 F, depending on the part being produced, and the wax is melting out.

Since the molds are poured while hot, operations of the melting department, which is located adjacent to the exit ends of the wax melting furnaces, are adjusted so that metal is ready for pouring as the molds become available. Indirect arc furnaces, developed and patented by Austenal Laboratories Inc., are used for melting and pouring the charge, which consists of 9/16-in. diameter bars of the desired alloy. These bars are cast from an alloy composition melted previously in electric induction furnaces. The arc furnaces are small since they are intended to hold only sufficient metal to pour one mold, or up to about 8 lb.

When the metal has reached the correct temperature the furnace operator obtains a red hot, baked mold, and clamps its gate opening directly over the top pouring spout of the furnace, as shown in Fig. 16. The metal is poured by inverting the entire furnace. Air pressure of about 3 lb is introduced over the metal through a hose permanently attached to the furnace, this assisting the metal to feed into thin sections.

Mold Is Cooled Slowly

After the metal freezes, the mold is removed from the furnace and allowed to cool slowly for about 4 hours, when the entire casting assembly is knocked from the mold by a pneumatic hammer directed against the gate (Fig. 14). Excess investment material is removed and the cast assembly is carried by conveyors to a station where gates and risers are cut off by a high-speed abrasive wheel. Shot blasting then removes scale and remaining investment material, although this operation is omitted for castings with thin edges. After rough inspection the castings are sent to the grinding department, where gate areas and surface irregularities are smoothed.

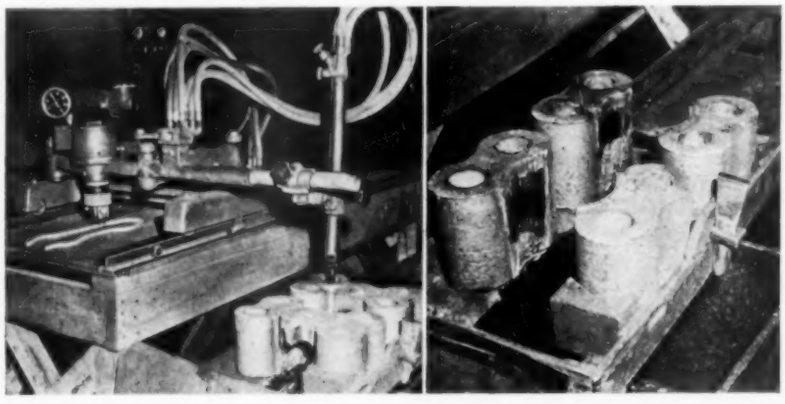
Next comes sand blasting, followed by another inspection, including a dimensional check. Castings that pass this inspection are put through a production Zyglo unit for disclosure of surface imperfections. The final quality check is by x-ray, employing the 250-kv production machine shown in Fig. 23. The head of this machine is fixed permanently at a focal distance of 50 in. and is completely enclosed in a lead-lined cabinet. The control panel operates automatically following an initial setting. These features, plus the ball bearing conveyor type table top attached to the base of the machine, permit one man to handle the complete operation, including setting up the castings prior to x-ray. During peak wartime production the machine exposed as much as 130 gross of 14 x 17 in. film a month. All x-ray negatives are checked closely before the castings are shipped.

Flame Cutting Aids Foundry Production

FOUNDRIES doing production casting work find oxy-acetylene cutting an excellent method of handling diversified riser and gate-removal jobs. The shape-cutting process, because of its contour-cutting capacity, can materially increase the production of finished castings by reducing the amount of grinding required per casting. The use of a templet-guided repetitive cutting setup with a machine such as shown in the accompanying illustration makes production cutting a semi-automatic procedure.

Shown here is a typical setup used by a foundry for the repetitive cutting of gates on return bends used in refinery piping. Castings are plain carbon steel fittings and are cast in clusters, each consisting of a pair of return bends connected by a gate 3 in. thick and 5 in. wide. To separate the fittings, two castings are clamped in the jig side by side and the necessary cuts are made in one continuous cycle in less than 10 minutes. A standard aluminum strip templet, shown at the left in Fig. 1, is used to guide the machine through these cuts, thus permitting the four cuts to be made continuously and automatically leaving as little material as possible to be finish ground.

A cutting speed of 10 in. per minute through the 3-in. steel is obtained by using a blowpipe equipped with a high-speed nozzle. At this speed seven dual setups can be accommodated per hour, amounting to a production rate of 224 return bends separated per day.

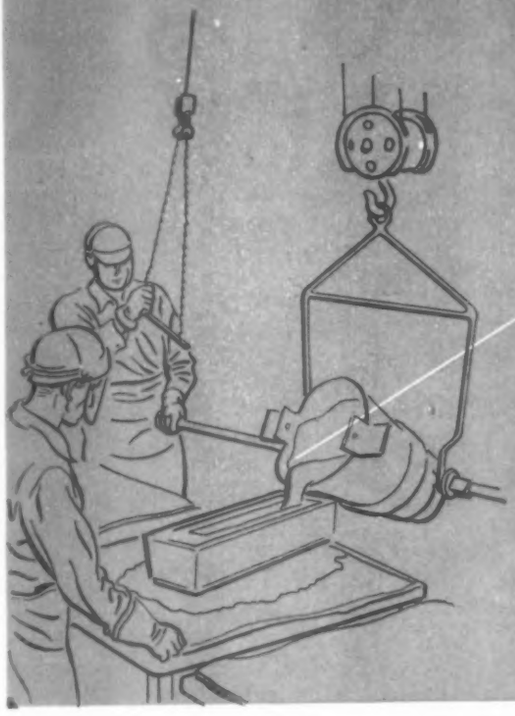


(Left)—Machine in action cutting gates from steel castings. Aluminum strip template at left automatically guides the cutting nozzle. (Right)—Completed cut showing cleanness of the operation which is typical of flame-cut work. (Photos courtesy Linde Air Products Co., New York)

in modern foundries everywhere

they're casting lightness

and strength



For lightness . . . and soundness and strength . . . they're casting magnesium today. It's a standard material for many modern castings, ranging from tiny fittings a few ounces in weight right up to big pump bases weighing hundreds of pounds.

Progressive foundrymen have come to recognize the good casting characteristics of magnesium alloys. Manufacturers know magnesium castings improve products because they weigh less. And there is no structural metal to equal the strength-weight ratio of magnesium.

Dow offers a full line of casting alloys and accessory materials, as well as the services of its own fully equipped foundry. Behind these products and services stands the experience gained during more than 29 years of producing, alloying, and fabricating magnesium. The nearest Dow office can give you full details on magnesium application.

Ready . . . to make products move!

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LIGHTEST OF ALL STRUCTURAL METALS

Dow produces casting alloys to meet a variety of property requirements; also a complete line of fluxes and accessory materials.

Continuous magnesium research and development work enable Dow to offer foundries full engineering assistance on all related technical problems.

Procedures and facilities for working magnesium, such as sand casting clean-up, are readily available in many modern plants.

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Activities of foundry GROUPS

Central Ohio

CENTRAL Ohio Chapter of the AFA turned out in force at the Mar. 25 meeting at the Chittenden Hotel, Columbus, to hear Dr. J. A. Ridderhof, Frederic B. Stevens Inc., Detroit, discuss core and mold coatings for iron and steel.

Dr. Ridderhof spoke of the effect of individual ingredients in the many core and mold washes now on the market, and illustrated the specific use of each. His talk also covered the various precautions necessary for obtaining optimum results in washes used in the foundry, together with the technique of storing, mixing, transporting and using them. He covered the various methods of applying these coatings, including brushing, dipping and spraying, and the applications in which each method has proved superior.

An interesting discussion followed the talk which covered the use of double coatings, either sprayed or brushed, and the methods of increasing or decreasing the ability of a given coating to prevent penetration in ferrous metal castings.—*Tom Barlow, chairman.*

Twin City

PATTERNS held the spotlight at the Feb. 20 meeting of the Twin City Chapter of the AFA, at the Curtis Hotel, Minneapolis, when L. F. Tucker, president, City Pattern Works, South Bend, Ind., gave a most interesting talk on "Co-operation Between Patternmaker and Foundry," supplemented with slides.

Mr. Tucker pointed out that the pattern is actually a molder's tool and that the casting can be no better than the pattern from which it is made. He stressed that the ultimate end and pride of the patternmaker should not be the finished pattern, but should go further—the finished casting produced as a result of that pattern.

The speaker stated that the molder wants a foolproof pattern. The best way to obtain this is through co-operation. The patternmaker should spend time with the foundryman and design the pattern equipment, based on the equipment in the foundry. It is up to the patternmaker to give the molder what he wants. A good example of this co-operation is to be found in the automobile industry where no pattern is built until it has the officially signed endorsement of the foundry.

Draft and shrinkage were cited by Mr. Tucker as being two factors which should receive special attention from both foundrymen and patternmakers. He recommended the construction of experimental patterns to check the effectiveness of draft and shrink allowanaces before a production pattern is made.—*J. W. Costello.*

W. W. Bowring (left), Frederic B. Stevens Inc., treasurer of the Detroit Chapter, AFA, the past ten years, and W. B. McFerrin, Electro Metallurgical Sales Co., chairman of the Chapter's lecture course committee, discuss ticket sales at the fourth educational lecture presented at the Rackham Memorial in Detroit. (Photo courtesy C. E. Silver, Michigan Steel Casting Co.)

St. Louis

REGULAR monthly meeting of the St. Louis District Chapter of the AFA was held Mar. 14 with 106 members and guests attending. Chairman Walter E. Illig presided. Walter Zeis, chairman of the membership committee, announced a membership of 225, and introduced new members present.

The chairman gave a short talk relative to the need of members participating in the activities of the chapter and the association and announced the names of the following, to serve as nominating committee for selection of officers for the 1946-1947 season: Chairman, Lou Kleber, General Steel Castings Co.; Joseph Walsh, Scullin Steel Co.; C. B. Shanley, Semi-Steel Casting Co.; R. Jacobsen, Carondelet Foundry Co.; E. A. Goerger, City Pattern & Model Co.; E. E. Ballard, National Bearing Division; and J. Williamson, M. A. Bell Co.

Fred Riggan introduced the guest speaker, J. A. Rassenfoss, whose subject was "Importance of Sand Control and Sand Testing." Mr. Rassenfoss emphasized that sand control means more than just sand testing and the need for knowing sand mixes. He illustrated his talk with slides and charts showing results obtained at various plants by accurate control of all elements. He also discussed methods and results obtained from reclamation of waste sand, and concluded with the

(*Continued on page* 236)

100 POUNDS NET WEIGHT
MOGUL
BRAND
CEREAL BINDER
CORN PRODUCTS REFINING CO. NEW YORK, U.S.A.
1860-1 LOT 195
MOGUL is a perfect Green Bond, which increases permeability in cores. Use MOGUL in cores for both green and dry strength.
MOGUL works with core oil because it decreases drying time and yields smooth cores. MOGUL works perfectly with pitch or rosin, too, because cores can be handled while still warm. MOGUL is widely used with sharp sands.
KORDEK
KORDEK is a perfect DRY BOND. It can be used in smaller quantities than most dry binders. KORDEK produces better castings with fewer discards.
CORN PRODUCTS SALES CO.
17 BATTERY PLACE · NEW YORK 4, N. Y.

(*Continued from page* 234)

statement that the quality of castings depends upon the quality of sand used, and its proper preparation. A question and answer period at the conclusion of the address was led by Chairman Illig. —*Lee H. Horneyer, secretary-treasurer.*

Pittsburgh

G K. EGGLESTON, vice president, Barnes Mfg. Co., Mansfield, O., addressed the Pittsburgh Foundrymen's Association at the group's regular monthly meeting held Mar. 18.

Mr. Eggleston's talk, titled "Has the War Taught Us Anything?", dealt with the possibilities of maintaining some of the makeshifts and substitutions made necessary by the war because of shortages of materials, manpower, and inability of manufacturers to expand productive equipment in line with the expansion of demand for their products. He cited experiences in increasing output at his company's plant in face of these handicaps.

Following Mr. Eggleston's talk, Peter Soffel, president, Pittsburgh Metals Purifying Co., Pittsburgh, and Earl Pierce, an associate, demonstrated a new exothermically reactive material for use as inserts in risers, hot tops and in other portions of metal castings where it is desired to maintain a high degree of fluidity of the metal or retard its solidification during the feeding or shrinkage.

The new material, a mixture of thermit powder and refractory binder, is known as Thermotomic and has many applications, such as core rings to be used under riser, or as a facing for molds localized where it is desirable to retain metal in a liquid state for an extended period of time; in gate cores and strainer cores to increase temperature of metal upon entering mold or to decrease size of gate at juncture of casting, simplifying its removal from casting; also at light sections integral to heavy sections to equalize solidification of metal.

The material generates heat through oxidation which is modified to control the rate of heat release. Once burned "thermotomic" changes from a heat generating agent to a refractory of high heat resistance.

Max Kuniansky, vice president, Lynchburg Foundry, Lynchburg, Va., and vice president elect of the American Foundrymen's Association, is scheduled to talk on "Production Control for Cost Reduction" at the May 20 meeting.—*Joseph L. Sullivan.*

Chesapeake

SYNTHETIC Sand" was the subject of an address by N. J. Dunbeck, vice president, Eastern Clay Products Inc., Eifort, O., and chairman of the Central Ohio Chapter of the AFA at the February meeting of the Chesapeake Chapter of the AFA, at the Engineers' Club, Baltimore. Mr. Dunbeck presented an extremely well organized summary of this important and complex topic. He discussed the following three questions in sufficient detail to cover each one adequately: 1. What type of foundry should use synthetic sand; 2. What type of clay should be used; and 3. How to make the use of synthetic sand economical.

Vice Chairman David Tamor called on Max Kuniasky and Wally Levi of the Lynchburg Foundry Co. to open the discussion period with comments on their

(*Continued on page* 238)

SOUTHERN CALIFORNIA: *Top Left*—Portion of attendance at March dinner meeting of Southern California Chapter, AFA. *Top right*—Shown left to right are Paul E. Crow and S. R. Kimberly, Equipment Engineering Co.; Paul Siechert and Glen Hopping, Alhambra Foundry; William Palmer, Macklin Co.; C. E. Homer, Kinney Iron Works; C. G. Emery, Macklin Co., and Frank S. Mittl, King Iron Works. *Bottom left*—James E. Eppley, T. J. Machine Works; Clarence C. Pendrell and Fred S. Boericke, Haynes Stellite Co., and Robert R. Haley, Advance Aluminum & Brass Co. *Bottom right*—Jhan Van Heil, F. Harwood Clark and A. E. McVicar, Torrance Brass Foundry

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IS OUR BUSINESS

it's what we have to sell

Tote pans of castings are fed to machine operators by incoming line of Logan Roller Conveyor at left. After machine operations are performed, castings are placed in tote pans which move via short Transfer Lines of Logan Rolls to long line of Logan Roller Conveyor at right. Thence to succeeding operations, or storage. No "waiting time," no lost motion, virtually no hand-handling between operations.

YOU don't buy foundry conveyors by the pound — nor by the piece. You buy equipment which, when installed, is an integrated, workable plan for moving molds and castings through successive foundry stages. And the heart and core of this plan is *engineering.* Economies in time, effort and space are reaped in direct proportion to the skill and care exercised on the drafting board. Logan, a conveyor pioneer, with two generations of experience, has justifiable confidence in its staff of engineers. At the home plant, and in the field as well, Logan Co. offers grade-A talent to serve a host of nationally-known customers. Write for literature, or for nearest Logan engineer to call. **LOGAN CO., Inc., 580 Cabel St., Louisville 6, Kentucky.**

Earning Power comes before Buying Power

PRESERVE FREE ENTERPRISE

Logan Conveyors

PUT *FLOW* INTO PRODUCTION

(*Continued from page* 236)

experiences with synthetic sand. Howard Williams, New Jersey Silica Sand Co., and Jack Mentzer, Taggart & Co., Philadelphia, then discussed the impending shortage of cereal binders and methods of comparing synthetic and natural sands.

Following the discussion an interesting film entitled "Eternally Yours," was shown, depicting the manufacture of wrought iron by the A. M. Byers Co.—*Lt. (jg) John T. Robertson, USNR.*

TWIN CITY: Scenes at the March meeting of the Twin City Chapter, AFA. (Photos courtesy Paul Pufahl & Son Foundry, Minneapolis)

Philadelphia

MONTHLY meeting of the Philadelphia Chapter of the AFA, held Mar. 8 at Franklin Institute, was attended by approximately 300 guests and members. The meeting, listed as "Nonferrous Night," was planned and executed by one of the chapter's strongest supporters, Dr. G. H. Clamer, president, Ajax Metal Co., Philadelphia. Dinner was served in Franklin Hall, at the feet of the huge memorial dedicated to the memory of one of our greatest inventors and statesmen, Benjamin Franklin. The meeting then moved to the lecture hall of science which furnished a fitting environment for Dr. Roy K. Marshall's discussion of "Atomic Physics."

Frank T. Chestnut, Ajax Metal Co., set the stage by relating his experiences and views regarding the social and military aspects of a defeated Japan. His visit to that country as a representative of the U. S. Navy Technical Mission gave him an opportunity to learn firsthand of the extent of Japanese defeat. His comments and photographs relating to the destruction wrought by allied bombs left one awed at man's ingenuity for war.

Mr. Chestnut commented on his visit with the eminent Japanese scientist, Dr. Honda. He brought back with him examples of the handicraft of the Japanese nonferrous foundryman. Exquisitely designed and cast bronze dishes and statuettes were on display for inspection. The speaker illustrated, by means of the Geiger counter, the radioactivity of a piece of tile found in the area of the Hiroshimo atomic bombing. Contrary to circulated reports, the atomic bombing did create considerable radio activity in the neighborhood of the bombing.

Dr. Clamer then introduced Dr. Roy K. Marshall, director of Fels Planetarium, associate director of Franklin Institute, and science editor of the *Philadelphia Evening Bulletin*. Dr. Marshall is inspired by the flame of truth. His contempt for the political aspirations of those who would throttle scientific research and the interchange of the fruits of such research, was something at which to rejoice. He not only brought atomic physics down to the level of the layman, but raised the vision of the layman to the possible changes in social aspects resulting from the use of this new tool. He pointed out the possibilities of the greatest power ever given into man's hands, a power so terrible in its destructive, and so wonderful in its constructive pontentialities. As a tool of war it makes human brotherhood a passionate necessity. As a tool of peace such brotherhood becomes a possible reality. To quote from Dr. Marshall, "Either be wise or die."

Dr. Marshall stated atomic physics

(*Continued on page* 240)

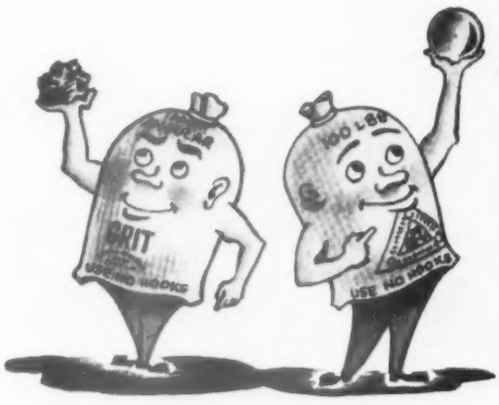
FASTER, LOWER-COST BLAST-CLEANING

because every grain is a complete cutting tool!

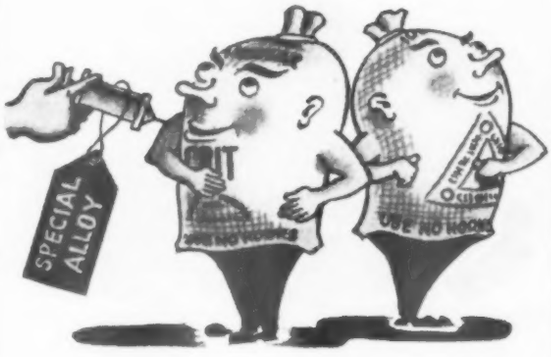
Here are the reasons CERTIFIED Samson Shot and Angular Grit help you get the best results from your blast-cleaning and at lower costs.

CERTIFIED

does better work — longer — because —



1. Each grain—due to an exclusive process — is a solid homogeneous mass free from the cleavage lines which speed disintegration of ordinary abrasives.



2. A special and costly alloy—unavailable during the war — greatly increases the hardness of the virgin iron.

3. Automatically-controlled heat treatment, and a special tempering treatment, develop maximum hardness and durability.

See **MALLEABRASIVE**
The Super Abrasive outcome of the war
BOOTH 1515
Golden Jubilee AFA
Cleveland, May 6–10

Pittsburgh Crushed Steel Co.
PITTSBURGH, PENNA.

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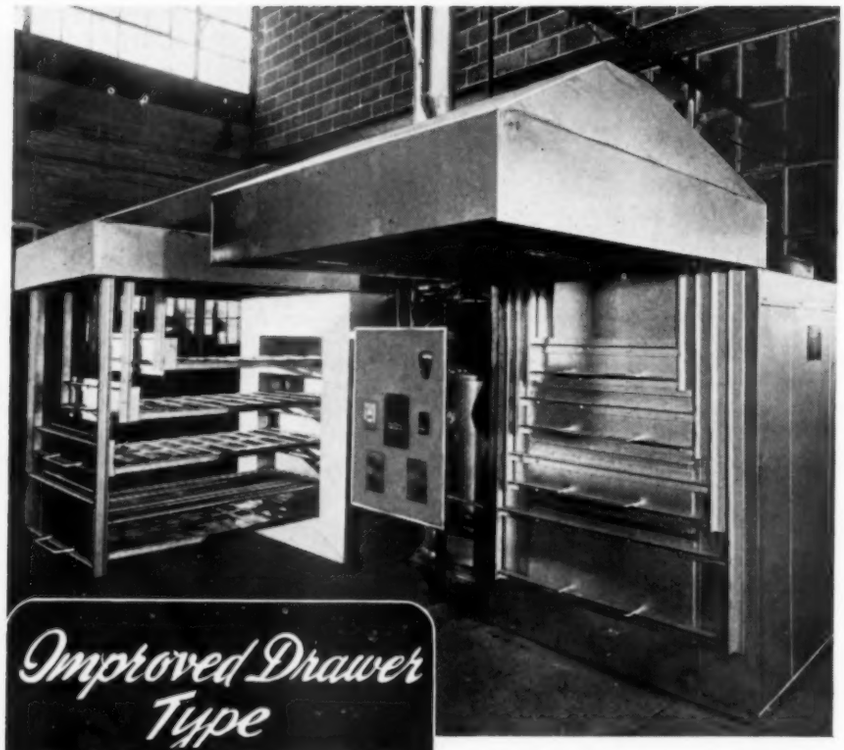


Improved Drawer Type LANLY OVEN

Note panel board mounting instruments which provide full automatic control of temperature.

Illustrated are two improved drawer type Lanly Ovens heated by a single air heater of the direct-fired atmospheric pull-through type with intakes for both fresh air and recirculated air.

These modern automatically controlled ovens assure economical operation, high efficiency and less breakage in baking cores.

One or more drawers may be opened at the same time—no cam levers or releases required—no jarring to cause core breakage. Each drawer is carried on ball bearing trolleys assuring easy, smooth and vibrationless action.

Full descriptive information available upon request. Write for it and the general Lanly catalog.

THE LANLY CO.
OVENS FOR INDUSTRY
HEATED BY GAS, OIL, ELECTRICITY OR STEAM
750 PROSPECT AVENUE · CLEVELAND, OHIO

(*Continued from page* 238)

knows no boundaries as established by nationalistic governments. The physicist must not be shackled by restraining legislation such as is now being considered by a misguided, hysterical minority, if this tool is to become one of peace. Any legislation to control the free dissemination of atomic knowledge will bring distrust among nations and eventual governmental regimentation of the people who could know and use this new force for betterment of mankind.

Copies of Dr. Marshall's lecture, entitled "Atomic Bomb, Stars and Atoms," may be secured from the Franklin Institute.—*E. C. Troy, reporter.*

Michiana

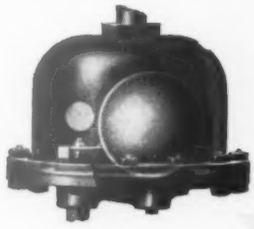
MICHIANA Chapter of the AFA held its Mar. 5 meeting at the Spaulding Hotel, Michigan City, Ind., with 106 members and guests in attendance. This was the first meeting held by the chapter in Michigan City, and John Miller of Josam Products Foundry Co., made all of the arrangements, providing the guests with dinner music and some very good entertainment. He presented Chapter Chairman William V. Johnson with a miniature shovel and rammer, to be used to call chapter meetings to order. These fine pieces of workmanship were made by Lew Minix, Josam Products Foundry Co. Another sample of Mr. Minix's work was a one-piece cast saucer, cup and spoon which was given as one of the door prizes of the evening.

Guest speaker for the meeting was Frank G. Steinebach, editor of THE FOUNDRY, whose subject was "Progress in Castings." Mr. Steinebach first discussed influences which were brought to bear upon the foundry industry during the war and their effect in the years ahead. He stressed progress made by the steel casting industry as a result of its efforts in Washington to sell the availability of cast steel for war materials and stated that many of the difficulties of the early war period might have been avoided if producers of gray and malleable iron had been as progressive in this regard. Technological developments in the foundry industry were discussed.

Mr. Steinebach then outlined the lessons that foundrymen should have learned during the war. He stated that the success of the foundry industry demands the cooperative efforts of all types of foundries. Out of the war came the firm conviction that castings are basic engineering materials in almost all types of production. A realization of their importance has at last become firmly fixed in the minds of foundrymen.

The speaker concluded by mentioning factors which should be given special con-

(*Continued on page* 242)



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Hot air carries moisture.
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corrodes pipes,
freezes,
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from compressed air lines
or money refunded.
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None too small.
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State your problem.
You will receive our prompt attention.

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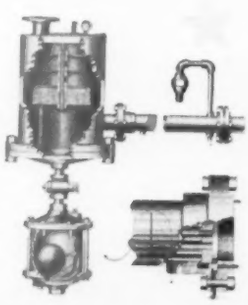
Moisture Elimination Up To 3000 Pounds Per Square Inch

SPRAY GUNS
AND PISTOL SPRAYERS TOO!



Over the years Ottawa's two outstanding brands —FLINT SHOT and DIAMOND SAND BLAST—have stood the test of time. Today usage of these high quality mineral abrasives is at an all-time high—in tonnage—number of users. Let us help you improve the quality and quantity of your sand blasting operation. Consult us on your abrasive problems.

Write for our booklet—SAND BLASTING UP-TO-DATE

OTTAWA SILICA COMPANY
Ottawa, Illinois

(*Continued from page* 240)

sideration by the industry. Research, increased attention to good housekeeping and greater mechanization of operations, interesting young men in foundry careers and customer relationship are important factors. Other foundry needs include better cost accounting, elimination of price cutting, production of a uniform product, greater technical control and the greater use of production knowledge already available. The foundry industry may look forward to the future with confidence if the technical developments of the war years are used to advantage in producing castings for an economy of peace.—*H. B. Voorhees.*

Saginaw Valley

J A. GITZEN discussed core and mold washes at the Saginaw Valley Chapter, AFA, meeting Mar. 7, at Frankenmuth, Mich. He pointed out at the beginning that the best of washes will not perform satisfactorily if the base sand to which it is applied is not suitable.

The speaker enumerated the properties of a good wash and discussed them. Among these were:

1. High refractoriness.
2. High hot strength.
3. Expansion characteristics similar to those of the sand.
4. Waterproof qualities after drying.
5. Wash should act as a seal to prevent core or mold gases from entering the mold cavity at the areas washed.
6. Wash should not develop gases at high temperature when iron flows over it.

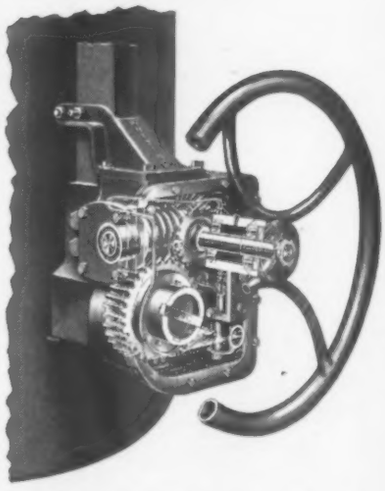
Some of the points to observe in making up and applying washes, Mr. Gitzen described as follows:

1. Use the wash as recommended by the manufacturer. Do not mix other materials in with the wash unless the manufacturer approves. Failure to do this may result in mixing two very highly refractory substances which together will form a low fusion product which defeats the purpose of the wash.
2. Use the proper consistency—check the baume with a hydrometer.
3. Mix the wash 24 hours in advance to allow thorough dispersion and suspension of ingredients.
4. Do not apply the wash in a heavy layer, but do be sure that the wash penetrates at least three grains deep.
5. Washed cores should be dried in the oven or else they should be washed while hot so that the wash will dry thoroughly before use. Air drying of cold washed cores is usually not sufficient.
6. Spraying of cores in the green is

(*Continued on page* 246)

WHITING

Pour-Rite LADLES



POUR-RITE GEAR BRACKET

Above is a phantom view of the new Pour-Rite gear bracket, developed by practical foundrymen to meet the needs of severe foundry service. It is designed for precision operation . . . greater pouring output . . . sharply reduced operator fatigue . . . exceptional safety . . . and long service life.

Positive controls assured with self-locking gearing and the elimination of backlash. Force feed lubrication is completely automatic. Distortion in the ladle cannot bind or jam the gearing.

ADVANCED DESIGN FOR

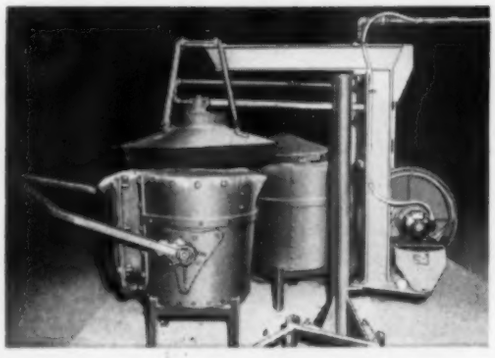
LONGER LIFE • GREATER SAFETY

EASIER HANDLING AND POURING

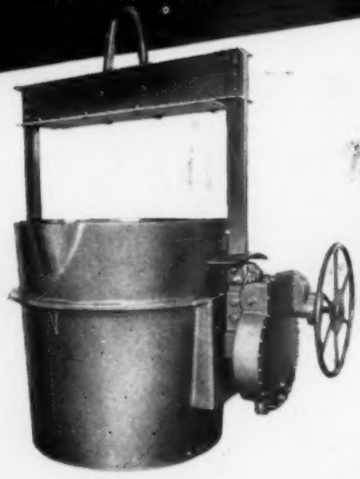
LADLES . . GEAR BRACKETS . . HANDLERS

ILLUSTRATIONS AND DESCRIPTIONS CONTINUED ON FOLLOWING PAGES

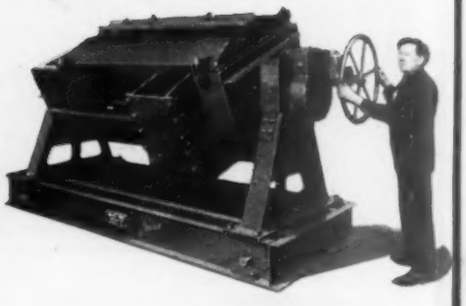
Whiting ladles for every foundry need! . . . .



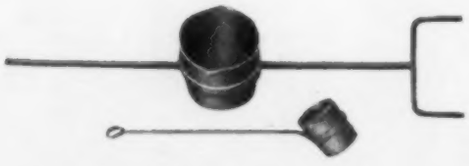
WHITING LADLE PREHEATER can be gas or oil fired.



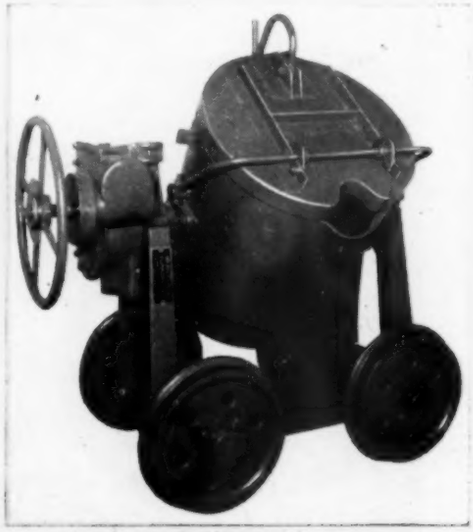
Whiting Crane Ladle. All welded, reinforced construction, and air-cooled trunnions are features of Whiting lip-pour crane ladles. Trunnion bearings are self-aligning, anti-friction roller type, with dirt-sealed housings for low maintenance. Gear brackets available for all sizes.



U-Ladle for mixing and desulphurizing. Features minimum temperature loss, greater fluidity, and less refining agent, with a constant mixing action to level off composition. Available in 1,000-lb. capacities and larger.



Whiting Shank Ladles and Hand Ladles are durably made of heavy steel plate with taper sides and drawn lips.



Whiting Truck Ladle—equipped with gearing and insulated cover.

Whiting Bottom Tap Ladles. Improved bottom tap mechanism, lever operated from the side. Furnished with or without gearing in various sizes.

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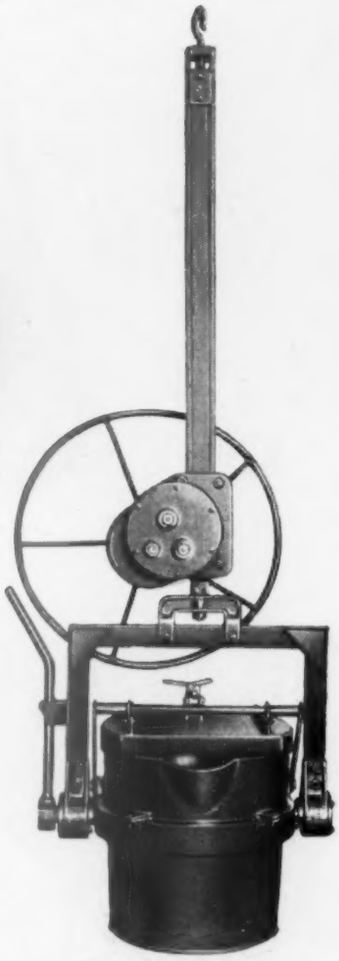
Offices in Chicago, Cincinnati, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis, and Washington, D. C. Agents in other principal cities. Canadian Subsidiary: Whiting Corporation (Canada) Ltd., Toronto, Ontario. Export Department: 136 Liberty St., New York 6, N. Y.

Whiting Teapot Ladle with split steel spout; can be relined quickly without disturbing the bowl lining.

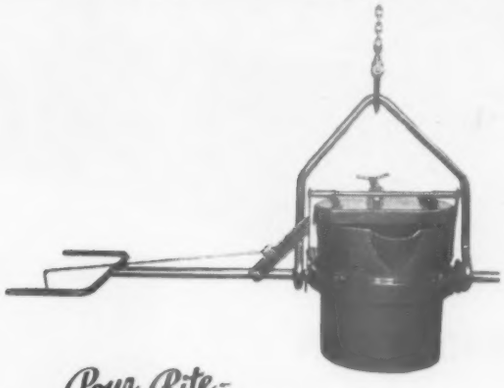


Pour-Rite CYLINDRICAL POURING LADLES

Lining ease and dependable trouble-free operation are features of this ladle. The easily removable, side-shifting cover facilitates lining operations.

Pour-Rite cylindrical, square bail mold pouring ladles are available in capacities of 200 to 800 pounds with vertical hand lever tilt, and in capacities of 600 to 1,500 pounds with gear bracket tilt.

Whiting 35-Ton Ladle, equipped with skimming spout . . . a specially designed ladle to solve a special pouring problem.



Pour-Rite TROLLEY POURING LADLES

These ladles offer all the advantages of welded, high strength construction, plus trouble-free, easy operation. The basket type suspension shanks permit easy bowl removal for relining and allow for bowl expansion, preventing cracking of the lining. Other features include air-cooled trunnions with dirt-sealed, anti-friction bearings, and a permanently nonbinding, shielded cover.

Available in capacities of 200 to 1,500 pounds with straight or offset shank.

Whiting Slag Ladle, with tipping mechanism.

Pour-Rite LADLE HANDLERS

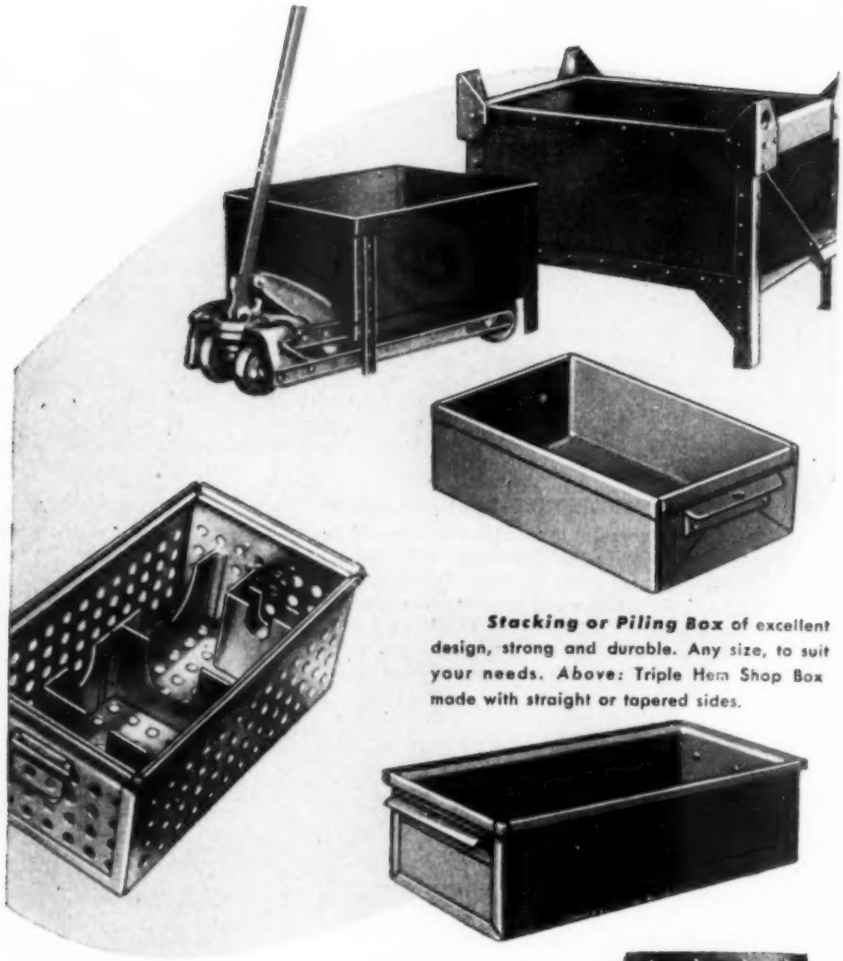
Here is new pouring efficiency at minimum cost. The Pour-Rite Ladle Handler is designed for extreme maneuverability and faster, simpler operation. The load is carried on a newly developed, shielded roller chain and sprocket with higher safety multi-tooth loading. Combines ease of handling with accuracy of pouring and maximum safety.

Pour-Rite Ladle Handlers are available in 500, 1,000, and 2,000 pound capacities, with lifts of 2, 2½, and 3 feet. Extensions can be added for use with monorails or light pouring cranes . . . equipment which also may be obtained from Whiting.

Pour-Rite taper side ladles are available in capacities of 200 to 800 pounds with vertical hand lever tilt (as shown above); and in capacities of 600 to 1,500 pounds with gear bracket tilt.

WHITING LADLES . . .

See us at the Golden Jubilee Foundry Show May 6 to 10, 1946



Stacking or Piling Box of excellent design, strong and durable. Any size, to suit your needs. *Above:* Triple Hem Shop Box made with straight or tapered sides.

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flowing smoothly

Where small, loose products are used or produced, perfecting the materials handling system is often the most important factor in attaining lower production cost. An essential part of the system is properly designed, light and strong metal shop containers for the pickup, collection, and conveyance of materials to and from machines, finishing, assembly, packaging and storage.

Cleveland shop boxes, barrels, cans, pans and pails are usually custom-made, because the small extra first cost is trifling compared with the advantages gained, year in and year out, by having containers of exactly the right size, shape and design to fit individual needs and special handling requirements.

Catalog, prices, and design service on request, without cost or obligation.

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Cleveland
STEEL SHOP EQUIPMENT
STOCK STYLES FOR GENERAL UTILITY
BUILT-TO-ORDER to meet special requirements

(*Continued from page* 242)

good practice because there is positive drying of the wash in the subsequent baking of the cores.

7. Do not expect a wash to perform its work if the core surface to which it is applied is torn up or the surface is cracked.

The coffee talk was presented by Robert Balfour of the *Flint Journal* who told of some of his experiences as a communications officer in the Navy.

The next meeting is scheduled for April 4, when O. Smalley of the Meehanite Metals Corp. will speak on "European vs. American Foundry Practice."—*Joseph J. Clark, reporter.*

Central Illinois

MARCH 18 meeting of the Central Illinois Chapter of the AFA was held at Jefferson Hotel, Peoria, Ill. The chairman, Ed Roby, introduced the speaker of the evening, Lester B. Knight, president of Lester B. Knight & Associates, consulting engineers, Chicago, who discussed "Foundry Mechanization and Modernization."

The speaker stated that modernization of a foundry is not necessarily mechanization, as foundry modernization includes modern thinking on the part of owners, engineers, and operators as well as installing improved facilities. He said that modern engineering and sales methods must also be used, and to operate a foundry in a modern and efficient manner, it is of primary importance that the producer be allowed to produce full time under good conditions. Mr. Knight asserted that modern competition demands highest quality and lowest unit costs; the most important factors are organization, procedures and methods, cost controls, and lastly facilities.

Mr. Knight said that equipment or facilities are not better than the men and producers back of them; equipment will not think for itself; this is up to the men. The speaker declared that it is essential that the foundry be properly organized with authority designated so that one man can say "yes" and "no" in matters of policy and practice. The organization, in Mr. Knight's opinion, should be simple.

The first step toward modernization any foundry should take is an analysis of each of the several departments in the plant with a check on methods and costs; most foundries have developed from a small beginning by making changes demanded by changes in work. After proper consideration of the overall layout, Mr. Knight recommended making a detailed outline of requirements and costs to illustrate the econ-

(*Continued on page* 248)

PROMPT DELIVERY

on "Industrial" Fabricated

Steel Flasks and Slip Jackets

★ *Parting Line* on cope and drag is surface-ground for accurate fit.

★ *All-Welded* construction from hot-rolled steel plate.

★ *Custom-built* to your specifications.

SLIP JACKETS

Accurate and light weight, you will find our slip jackets durable and made as you specify.

We have been supplying custom-built flasks and jackets to the automotive foundries in Michigan for some time . . . now offer to the foundry trade our facilities and specialized "know-how." Our equipment is precision-made from best materials to your specifications. An "Industrial" flask is your best assurance of good work and long life under the toughest foundry conditions. For good delivery and good construction, write, wire, or phone *Industrial Fabricating, Inc., Eaton Rapids, Michigan.*

We invite your inquiry—send us your blue prints and requirements and we'll gladly quote you prices and delivery dates.

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ALUMINUM
Dustfoe
RESPIRATOR

U. S. Bureau of Mines Approved

LIGHTWEIGHT!
HEATPROOF!
ADJUSTABLE FACEPIECE!
DURABLE!

The famous M.S.A. Dustfoe Respirator, with aluminum facepiece and filter container, is again available to the foundry worker. Unaffected by heat conditions on the job, the Aluminum Dustfoe Respirator is strong and durable, yet compact and lightweight for maximum wearing comfort. The cushion facepiece is adjustable for perfect individual fit on any face—all parts are replaceable and interchangeable—the entire unit can be cleaned and sterilized with the exception of the inexpensive throwaway filters. Send us your requirements!

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District Representatives in Principal Cities
In Canada, Mine Safety Appliances Company of Canada, Limited
Toronto, Montreal, Calgary, Vancouver, New Glasgow, N. S.

(*Continued from page 246*)

omies of the proposed changes; any major changes must be self-amortizing in a short period of time.

Mr. Knight then showed slides which illustrated the points in his talk. A question period followed in which he discussed different phases of modernization and answered many questions raised by the group.

It was announced that plans are in progress for a picnic to be sponsored by the chapter in June.—*Carl W. Wade, secretary.*

Northwestern Pa.

TWO technical meetings and three meetings on education promotion work made March a banner month for the Northwestern Pennsylvania Chapter of the AFA. Regular meeting was held March 25, at the Moose Club, Erie, with 125 members and guests in attendance. Dr. Ralph Lee, Department of Public Relations, General Motors Corp., Detroit, was the guest speaker, and his talk, "Humanics in the Foundry," was enjoyed by those present. Dr. Lee speaks the foundry language and touched upon the various points of human relationship encountered in the foundry.

Ten representatives of the Foremen's Association of Erie, which has a membership of 750, were introduced. A. L. Mould, secretary of the Erie Y.M.C.A., offered the facilities of that institution to the Foremen's Association for the foundry exhibit to be held during the week of May 12. Douglas James, general chairman of the exhibit, gave a brief sketch of the plans that have been made. The exhibit promises to be the outstanding event of the first year's activities of the Northwestern Pennsylvania Chapter.

Larry Dunn, General Electric Co., Erie, reported that plans have been completed for installing equipment in the new foundry school to be opened in September at the Academy High School, Erie. General Electric Co. has provided a small furnace and muller for these classes. Mr. Dunn asked for additional equipment needed to make this new foundry course a success.

The Venango group of the chapter closed its winter schedule at a meeting held March 20 at the Penn Grove Hotel, Grove City, Pa., with 95 in attendance. Following the dinner, George Johnstone, Cooper-Bessemer Co., who acted as chairman of the meeting, introduced the officers of the parent chapter. Dr. Creig Hoyt, head of the School of Science of Grove City College, spoke briefly of the great strides the foundry industry has made in educating young men in their own laboratories, which colleges are unable to do. He praised the work of the

(*Continued on page 250*)

"We'll look for you at BOOTH 318 AT THE SHOW!"

Either you use bonding clay or you don't. In either case, we'll be glad to see you at the Foundry Convention, BECAUSE:

If you do use it, possibly, with our five different products and their many combinations to choose from, we can help you get more out of your investment.

If you don't use it, perhaps you should. We'll be glad to tell you just what bonding clays in general can do for you and how ECP clays in particular can improve your castings, cut your costs, or both.

We still hold that no one bonding clay can do all jobs equally well. Talk it over with us at the Convention.

Remember NO ONE BONDING CLAY WILL DO ALL JOBS EQUALLY WELL!

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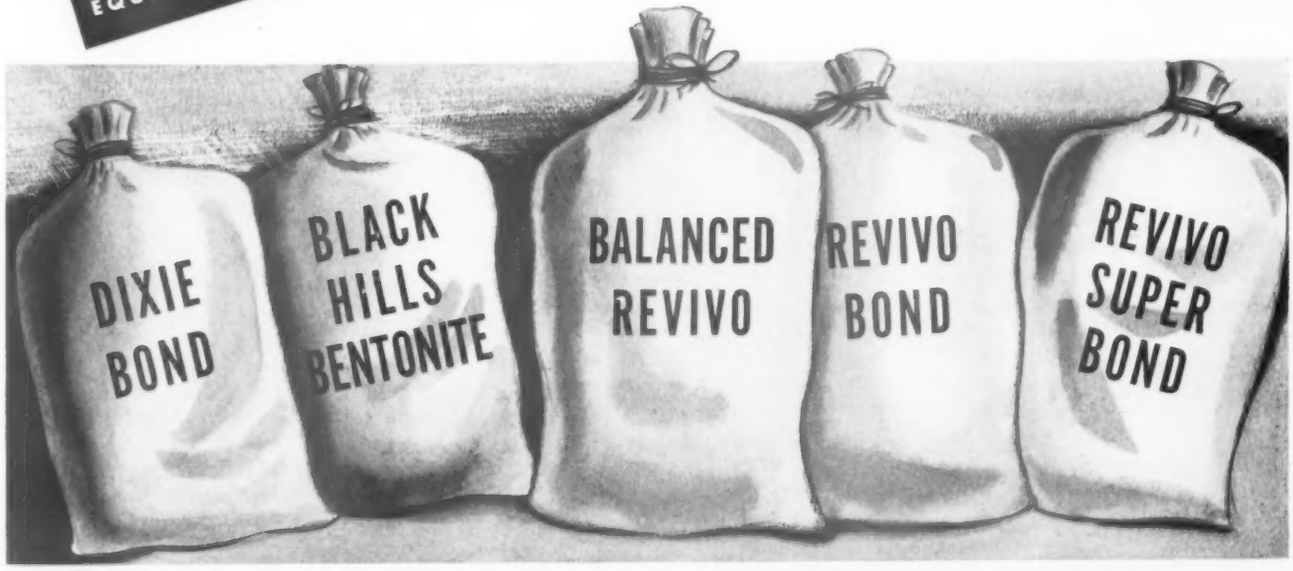

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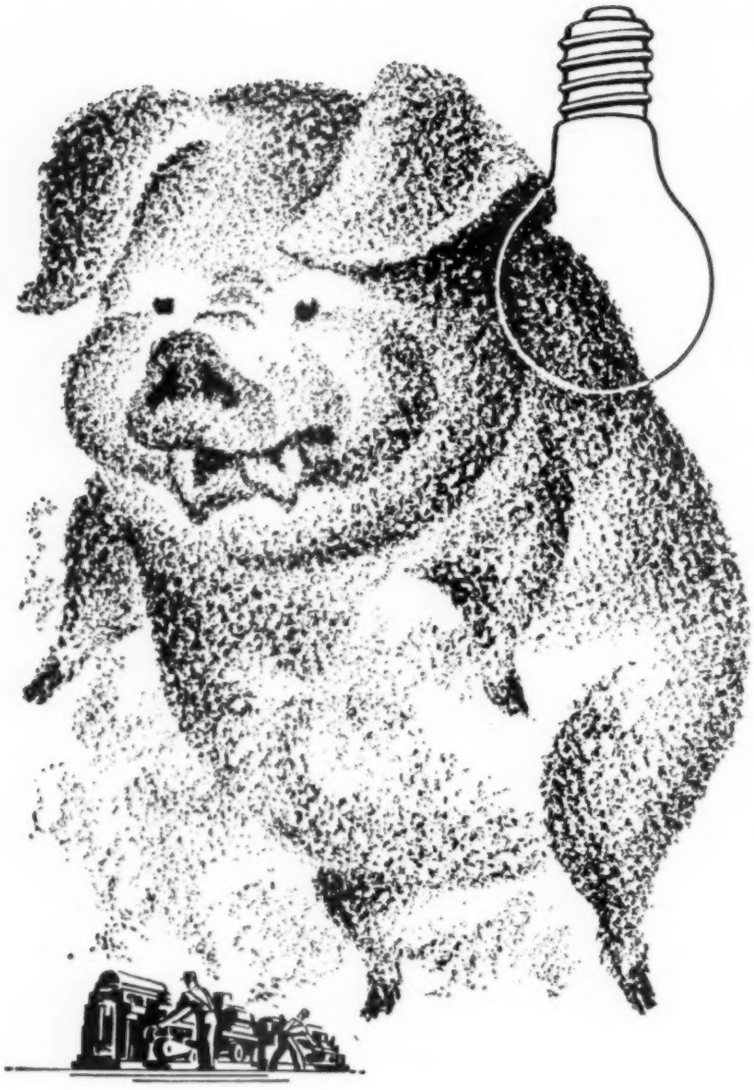
DIXIE BOND • BLACK HILLS BENTONITE • REVIVO BOND • REVIVO SUPER BOND • BALANCED REVIVO

All TYPES OF BONDING CLAYS

A Foundry Sand Service Based Upon Practical Research



Is DUST Hogging the Light You've Paid For?

DUST will, and DOES, hog the light you've paid for. At the same time he's stealing light, the DUST HOG soils your products, sabotages your machines and motors, decreases worker's efficiency, spoils paint jobs, increases maintenance and eats into profits.

WHY TOLERATE DUST? Send for booklet "Control of Industrial Dust", telling how to prevent costly "dust pockets" in your plant. Write PANGBORN — world's largest manufacturer of dust control and blast cleaning equipment. "COME TO PANGBORN" *NOW!*

Pangborn

PANGBORN CORPORATION, HAGERSTOWN, MARYLAND

(*Continued from page* 248)

AFA in sponsoring educational programs for the youth of America.

Tom Egan, Cooper-Bessemer Co., Grove City, presented an interesting discussion on "The Metallurgy of Gray Iron." Mr. Egan used slides to show the important part that inoculations play on graphite flakes which affect high tensile strength gray iron. He mentioned some of the phases of gray iron practice that would be discussed at the AFA convention to be held in Cleveland in May, and urged all to attend. An interesting discussion period followed the talk and Tom Beaulac, Chicago Pneumatic Tool Co., Franklin, Pa., thanked everyone for making these group meetings of the chapter most successful and beneficial in such a short time.—*E. M. Strick, reporter.*

Northern California

REGULAR Monthly meeting of the Northern California Chapter of the AFA was held Mar. 8 at the Engineers' Club, San Francisco. Prior to the main talk the group was addressed by William J. Logue, area supervisor, Apprentice Training Service, U. S. Department of Labor. Mr. Logue explained the application of the GI Bill of Rights in connection with apprentice training programs and existing labor contracts.

Harris Donaldson, Brumley-Donaldson Co., chairman of the membership committee, introduced several new members. The U. S. Navy Yard at Mare Island was well represented by Floyd J. Biava, E. L. Fetters, Chester P. Sobey, Floyd A. Waren and William J. Weber. Other new members included Jack L. Demello, Pacific Steel Casting Co., and William Skinner Jr., Vulcan Iron Foundry.

George W. Stewart, chairman of the sand committee, announced that there are a few copies of "Foundry Sands and Mold Materials" still available. Report No. Three is now being prepared for the printer.

Andrew M. Ondreyco, program chairman, introduced Fred G. Sefing, development and research engineer, International Nickel Co., New York, who presented "A Study of Molding Methods To Produce Sound Castings," which was illustrated with slides. Mr. Sefing prefaced the main body of the talk with the following three points: 1. In attacking any foundry problem, attempt to simplify thinking; 2. Regardless of the metal being poured, the same principles apply; and 3. It costs money to produce sound castings but extra cost is more than offset by reduction of rejects.

Mr. Sefing stated that there are four problems that confront all foundries: 1. Clean metal—All possible steps should

(*Continued on page* 252)

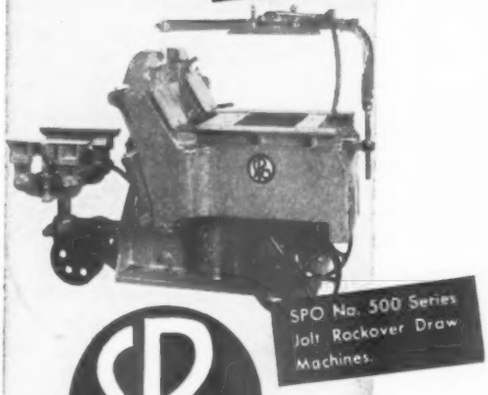
SPO MOLDING MACHINES

Fast, Profitable Workers for Exacting Requirements

SPO No. 100 Series Jolt Squeezer Machines, CANTILEVER Type.

SPO No. 200 Series Jolt Squeeze Stripper Machines, CANTILEVER Type.

SPO No. 300 Series Jolt Stripper Machines.



SPO No. 500 Series Jolt Rockover Draw Machines.

Variations in Size and Details Cover Wide Range of Molding Needs

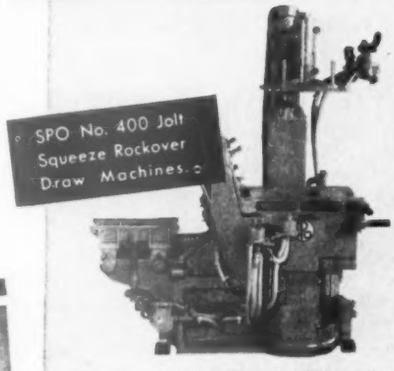
We still hold that the following are the main features for you to seek when you buy molding machines:

1. ***Speed*** **to get more molds.**
2. ***Accuracy*** **to insure molds true to pattern.**
3. ***Easy "learnability"*** **for beginners.**
4. ***Versatility*** **for handling many kinds of work.**
5. ***Compactness*** **to conserve floor space.**
6. ***Simple design*** **to minimize breakdowns.**
7. ***Stamina*** **for long service.**

Year in and year out, SPO maintains these advantages throughout its broad line—assurance to you of long, trouble-free, profitable operation.

SPO No. 100 Series Jolt Squeezer Machines, POST Type.

SPO No. 200 Series Jolt Squeeze Stripper Machines, POST Type.



SPO No. 400 Jolt Squeeze Rockover Draw Machines.

Bulletins showing capacities and other specifications on SPO Molding Machines will be supplied upon request. OR—*ask for them at the Show.*

MEMBER

MANUFACTURERS ASSOCIATION INC. FOUNDRY EQUIPMENT

SPO INCORPORATED

Manufacturers and Specialists in Molding Machines, Vibrators and Patterns for Production

7500 GRAND DIVISION AVENUE • • CLEVELAND 5, OHIO

NEW PRODUCTION METHOD SAVES POROUS CASTINGS

This new method is particularly applicable to engine blocks and heads, valve and pump housings and other castings intended to retain liquids or air under pressure.

K&W METHOD OF RECLAIMING POROUS CASTINGS

. . . is effective on practically all metals and alloys.

. . . fits admirably into mechanized production techniques—it is fast!

. . . costs little . . . often less than 20c in labor and material to recover a casting costing as much as $15.00 at the point of rejection.

Visit booth 1210 at the 1946 Foundry Congress and Show, Cleveland, May 6-10

IMPORTANT The statements made here are taken from the daily experience of some of industry's most important production foundries.

K&W METHOD OF RECLAIMING POROUS CASTINGS has been used successfully by the automotive industry for more than 10 years.

For further information, write

KERKLING & COMPANY

Industrial Division: 334 N. Ogden Ave., Chicago 7, Illinois
Plants: Burbank, Calif., Bloomington, Ind., and Chicago

(*Continued from page* 250)

be taken to prevent dust and slag from entering mold cavity; 2. Design—Consult the engineer before the pattern-maker. Proper design simplifies problems; 3. Shrinkage—Understand and practice the theory of controlled progressive solidification. Utilize risers, step-gating, knock-off feeders and atmospheric pressure risers; and 4. Porosity—This is generally caused by gas pressure which can be controlled by adequate venting, good cores and fast pouring.

The speaker concluded his talk with the following suggestions: Pressure castings must be poured fast. Vents should be rectangular, not round or square Records should be kept of every job so that the same results can be gotten a year or ten years from the original order. Considerable discussion followed the talk which indicated keen interest.

Guests at the speaker's table included C. C. Adams, newly appointed secretary of the Northern California Foundrymen's Institute, and Albert G. Zima, International Nickel Co., Los Angeles.—*Charles R. Marshall, publicity chairman.*

Eastern Canada and Newfoundland

REGULAR monthly meeting of the Eastern Canada and Newfoundland Chapter of the AFA was held Mar. 8 at the Mount Royal Hotel, Montreal. G. Ewing Tait, chapter chairman, presided.

A quiz program was presented under the chairmanship of Bernard Collitt, Jenkins Bros Ltd., who acted as quizmaster. His excellent handling of the questions and the general discussion with which the proceedings were interspersed were an outstanding contribution to the success of the program. Members of the chapter and others connected with the foundry industry were invited to send in questions in advance, with a view to securing information and at the same time attempting to stump the "experts." Questions were allotted to one or more of a board of six "experts," and the program, as is usual with this type of meeting, was entirely unrehearsed.

Many interesting questions were answered on a number of phases of foundry activities concerning cast iron, steel, nonferrous and light alloy castings, and much discussion was contributed from the members at large. The consensus was that the meeting was such a success that it will probably become an annual event. The board of "experts" consisted of the following chapter members: W. T. Shute, Canadian Car & Foundry Co. Ltd.; A. J. Moore, Montreal Bronze Ltd.; J. C. Con-

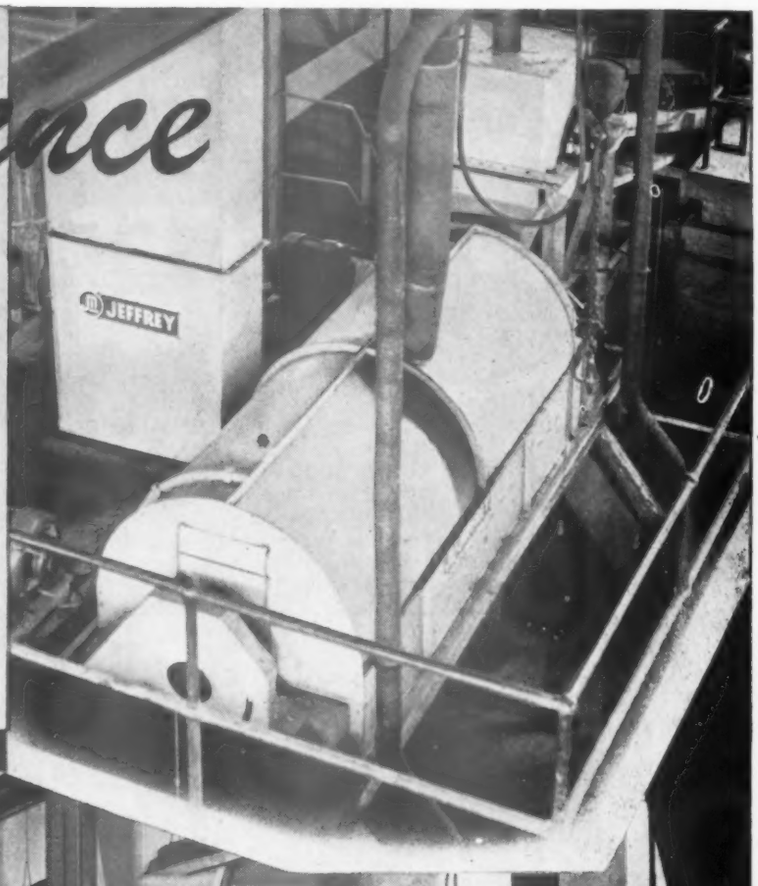
(*Continued on page* 254)

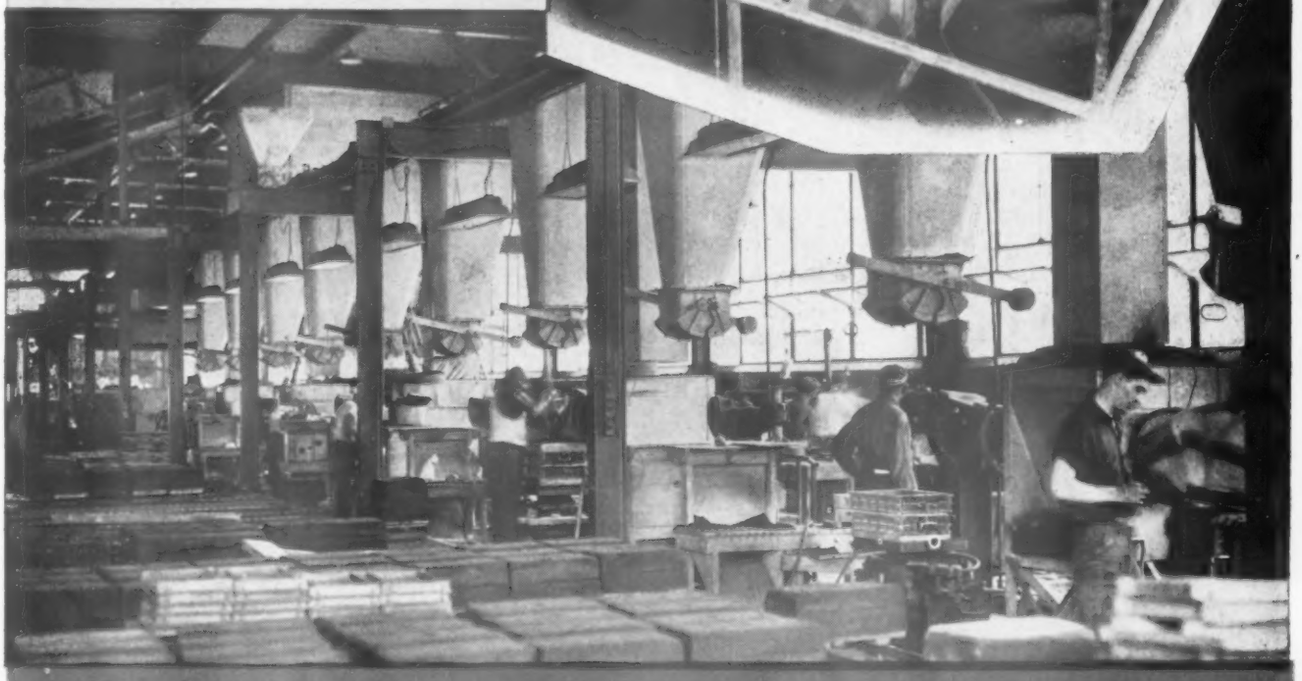
Experience Plus

CONSTANT IMPROVEMENT IN EQUIPMENT

The installation at the right shows a portion of a sand preparation plant including a magnetic separator, rotary breaker screen and bucket elevator.

Below is a battery of molders hoppers with roller conveyors leading from the molding stations to shake-out point.





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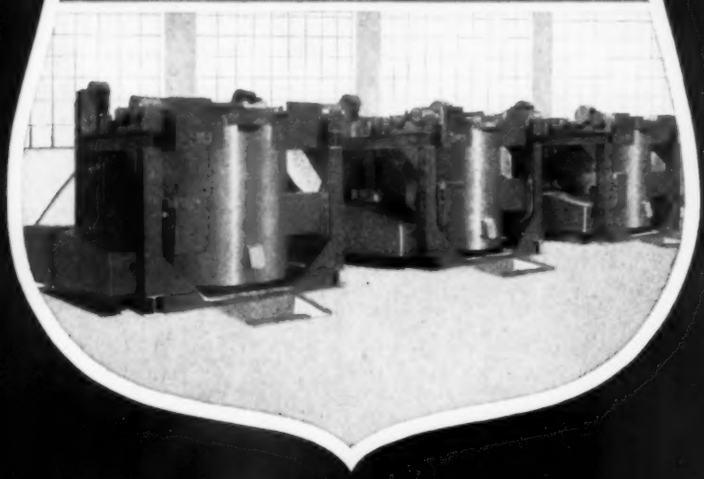
OR FUEL OIL



ARE MEETING EVERY EXACTING
REQUIREMENT

FURNACES FOR
BRASS • ALUMINUM • MAGNESIUM
AND ALL OTHER
NON-FERROUS ALLOYS

HAVE YOU INVESTIGATED THEM
FOR YOUR MELTING PROBLEMS?

The Campbell-Hausfeld Co.
300-320 MOORE ST. HARRISON, OHIO

(*Continued from page 252*)

verse, Crane Ltd.; A. E. Cartwright, Robert Mitchell Co. Ltd.; E. Cyr, Industrial Pattern & Foundry Works; and E. C. Winsborrow, Shawinigan Foundries Ltd.—*G. D. Turnbull, publicity chairman.*

Chicago

ROUNDTABLE meetings continue to command top interest of members of the Chicago Chapter of the AFA. The last in the series of three such meetings for the 1945-1946 season was held at the Chicago Bar Association, April 1, and although advance dinner reservations totaled about 125, attendance was close to 200, creating an embarrassing situation for chapter officers and the club's cuisine. Orchids were due the latter for handling the unanticipated overflow.

Chapter President J. C. Gore, Chicago manager, Werner G. Smith Co., presided over the general portions of the meeting, and L. H. Hahn, metallurgist, Sivyer Steel Casting Co., Chicago, chapter vice president and chairman of the program committee, put the roundtables under way.

Submitting the report of the nominating committee, Chairman James Thomson, works engineer, Continental Foundry & Machine Co., East Chicago, proposed the following chapter officers for 1946-47: President, Mr. Hahn; vice president, Fred B. Skeates, foundry superintendent, Link-Belt Co., Chicago; and secretary to succeed himself, Leslie C. Smith, Chicago district engineer, Peninsular Grinding Wheel Co., Chicago. The office of treasurer, now occupied by Bruce L. Simpson, president, National Engineering Co., Chicago, is appointive by the board of trustees.

Nominees for trustees for three-year terms include: Retiring President Gore; C. V. Nass, vice president, Pettibone Mulliken Corp., Chicago; D. H. Lucas, manufacturer's sales representative, Chicago; and H. K. Swanson, owner, Swanson Pattern & Model Works, East Chicago. The latter two will succeed themselves on the board. Election and installation will take place at the May 24 meeting.

George W. Anselman, service engineer, Geobig Mineral Supply Co., Chicago, addressed the Gray Iron roundtable on "Gray Iron Sand Service." The speaker dealt with natural bonded and synthetic sands and influence of grain size distribution. Glenn W. Merrefield, general superintendent, Chicago Hardware Foundry Co., North Chicago, Ill., was chairman.

Malleable division high-lighted M. E. McKinney, research metallurgist, International Harvester Co., Chicago, who discussed "Melting Furnace Atmosphere

(*Continued on page 258*)

Announcing

A NEW TYPE OF DOWEL...

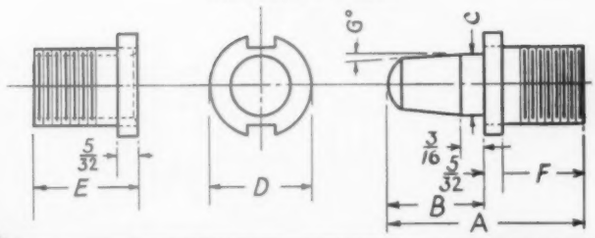
THE KINDT-COLLINS

MASTER SURE-LOCK* DOWELS

FOR METAL PATTERNS AND CORE BOXES

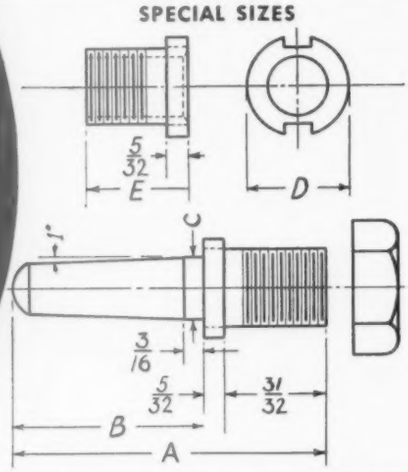
* PATENTS PENDING

STANDARD SIZES



NO.	A	B	C	D	E	F	G	THREAD
1	1-1/4	17/32	1/4	9/16	23/32	9/16	4°	3/8-24
2	1-11/32	5/8	5/16	5/8	23/32	9/16	2-1/2°	7/16-20
3	1-1/2	11/16	3/8	11/16	13/16	21/32	2-1/2°	1/2-20
4	1-19/32	25/32	1/2	13/16	13/16	21/32	4°	5/8-18

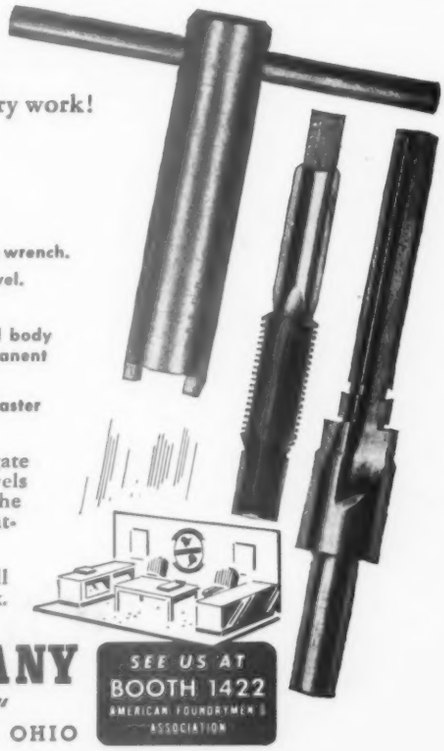
SPECIAL SIZES



NO.	A	B	C	D	E	THREAD
2	2-7/32	1-1/4	5/16	5/8	23/32	7/16-20
3	2-1/2	1-3/8	3/8	11/16	13/16	1/2-20

Here's the first real advancement in dowel design in years! The new MASTER SURE-LOCK Dowels now make possible new economy and efficiency in foundry work! Note these important SURE-LOCK Dowel advancements:

1. Inserted more easily, quickly, accurately.
2. New type shoulder and taper fit of body keep dowel anchored tight.
3. Replacements and consequent loss of time drastically reduced.
4. Longer, more accurate draw. Head of male part entirely round. No square edges to turn off with wrench.
5. New type wrench of hardened steel permits firm tightening of dowels. No stripping of dowel.
6. Dowels accurately machined from steel, hardened and cadmium-plated to prevent rust.
7. Sizes available: Nos. 1, 2, 3 and 4 Standard; Nos. 2 and 3 Special with extra long pin and body on male part. (See tables.) These long-bodied pins can be fitted with nuts for permanent installation. Nos. 2 and 3 Special can be inserted with Nos. 2 and 3 Standard wrench.
8. Only four tools required: Drill, Master-Sure-Lock Combination Counterbore and Reamer, Master Sure-Lock Tap, and Master Sure-Lock Wrench.



Note: Master Metal Dowels are still available. However, we urge you to investigate and try the new Master Sure-Lock Dowels. They readily replace Master Metal Dowels of equivalent size by counterboring a recess to fit the new type of shoulder on the Sure-Lock Dowel. Taps used for Master Metal Dowels can be used for equivalent-sized Master Sure-Lock Dowels.

Send us a trial order today and see for yourself how Master Sure-Lock Dowels will help you do a better, faster job. Standard package 50 in a box.

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THE KINDT-COLLINS COMPANY

"EVERYTHING FOR THE PATTERN SHOP"

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SEE US AT BOOTH 1422 AMERICAN FOUNDRYMEN'S ASSOCIATION

ACTIONS SPEAK-

★ VIBRATES IN ALL DIRECTIONS

★ HELPS PRODUCE PERFECT MOLDS

THE VIBROLATOR

★ POWERFUL VIBRATION

★ LIGHT IN WEIGHT

★ WILL NOT JAM

★ NEEDS NO LUBRICATION

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The "circular action" of the VIBROLATOR duplicates the technique used by skilled moulders in rapping a pattern in all directions to free it from sand.

Add to this distinct VIBROLATOR advantage the fact that it is of simple design with no close fitting parts to jam — nothing to get out of order — no lubrication required, and YOU, too, will agree that the new and modern VIBROLATOR has a very definite place in your Foundry. It is made in five sizes to meet every requirement.

But to really appreciate the many advantages the VIBROLATOR offers, we urge you to ask your Foundry Supply House for a free demonstration, or visit the Martin Engineering Company booth at the Foundry Convention where the VIBROLATOR will be demonstrated. See for yourself how well this powerful, yet small, VIBROLATOR performs. Actions speak louder than words!

WRITE YOUR FOUNDRY SUPPLY HOUSE FOR LITERATURE

LOUDER THAN WORDS

Ask Your Foundry Supply House For a Free Demonstration

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San Francisco, 3
Snyder Foundry Supply Co.
Los Angeles, 11

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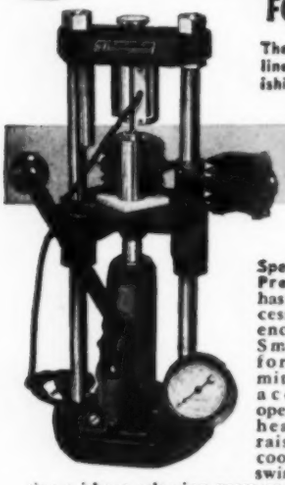
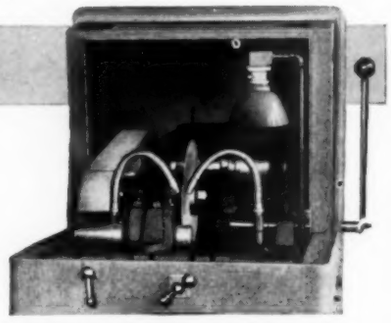
Buehler

SPECIMEN PREPARATION EQUIPMENT AND SUPPLIES FOR THE METALLURGICAL LABORATORY

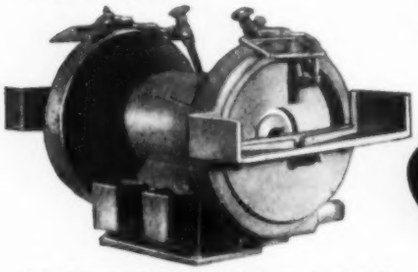
The items illustrated are selected from the complete Buehler line of equipment, tools and accessories for molding and finishing specimen mounts.



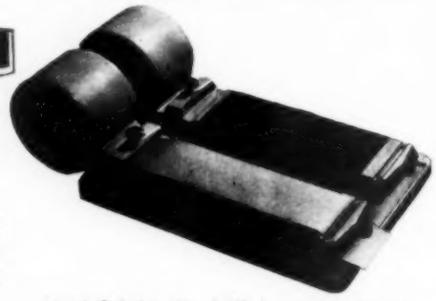
Specimen Mount Press No. 1315 has complete accessibility, no enclosed parts. Smooth performance permits speed and accuracy in operation. Solid heater can be raised and the cooling blocks swing into position without releasing pressure on the mold. This rapid cooling permits production of transoptic mounts in a few minutes. Shipping weight, 100 lbs.



Abrasive Cut-off Machine, Model No. 1000, is a solidly built, heavy duty piece of equipment free from sideplay or vibration with capacity for cutting specimen sections up to 3-1/2". Cutting is done on the front of the wheel and is controlled by a convenient outside lever. The driving motor is a totally enclosed ball bearing, 3 hp. with a separate motor driving the self-contained cooling system. Overall dimensions of cabinet 31" x 47" x 64". Shipping weight, 1400 lbs.



Wet Power Grinder No. 1210, powered with a 3/4 hp. totally enclosed ball bearing motor has two 12" water cooled wheels fitted with closed-in guards and non-shatterable shields. Suitable for coarse and medium grinding. Shipping weight, 310 lbs.



Hand Grinder No. 1410 is a most conveniently arranged two stage grinder. The grinding surfaces are 4-1/2" x 12-1/4" each with heavy 7/16" thick plate glass back. A reserve roll of 150 feet of emery paper is contained in drums for quick renewal of grinding surface. Base has gutter drains for surplus liquid in wet grinding operations. Shipping weight, 95 lbs.

Standard Polisher No. 1500. A complete unit with direct mounted ¼ hp. radial thrust ball bearing motor. The 8" polishing disc is attached to a tapered arbor on the motor shaft by means of a stout sleeve. This sturdy construction and unusually smooth vibrationless operation helps to prevent pitting and amorphous film in polishing. The removable splash ring forms a convenient hand rest that aids the operator in precision work. A handy control lever on the mounted switch gives selective speeds of 575 and 1150 r.p.m. Shipping weight, 100 lbs.

Low Speed Polisher No. 1505-2, is particularly adapted to final stage polishing and for non-ferrous metal samples. The 8" disc is attached to a countershaft by a tapered sleeve with a long span between bearings, a construction feature that assures smooth operation. The selective speeds of 150 and 250 r.p.m. make this polisher perfectly adapted to the wax lap or lead lap polishing technique. Shipping weight, 105 lbs.

Either the standard or low speed polishers can be furnished in a single unit table model polisher No. 1516. A three unit table model No. 1540 is also available for maximum convenience in three stage polishing.

In the complete line of Buehler accessories and supplies for the metallurgical laboratory are found: Abrasive paper sheets, discs, and rolls in every grade • polishing solutions • polishing cloths • cut-off wheels and molding powders. Buehler service includes everything needed for preparing precision specimens from metallurgical samples, available from one reliable source.

Buehler Ltd.
A PARTNERSHIP

METALLURGICAL APPARATUS
165 West Wacker Drive, Chicago 1, Illinois

(*Continued from page* 254)

Control." He focused attention on control of composition and insurance of uniform response to annealing. Cecil Semrau, metallurgist, Illinois Malleable Iron Co., Chicago, presided.

"Certain Aluminum Foundry Problems —Their Causes and Elimination," was the subject which R. G. Quadt, research metallurgical engineer, Federated Metals Division, American Smelting & Refining Co., Perth Amboy, N. J., discussed. Oscar Blohm, chief metallurgist, Hills-McCanna Co., chairmaned the session.

Steel division devoted its attention to "Sand Control," with John A. Rassenfoss, research metallurgist , Indiana Harbor Works, American Steel Foundries, East Chicago, Ind., as speaker. W. A. Linchester, superintendent, Western Foundry Co., Chicago, presided as chairman, and Leo F. Dennie, sand technician, Burnside Steel Foundry Co., Chicago, was discussion leader.

Chicago Chapter will close its year with the May 24 meeting at the Chicago Bar Association, with Max Kuniansky, vice president and general manager, Lynchburg Foundry Co., Lynchburg, Va., and nominee for national vice president of the AFA, as guest speaker. This meeting is postponed from customary first Monday of the month because of the Cleveland convention.—*Erle F. Ross.*

Metropolitan

AN address on core and mold washes by J. A. Gitzen, president, Delta Oil Products Co., Milwaukee, featured the regular monthly meeting of the Metropolitan Chapter of the AFA, at the Essex House, Newark, N. J., Apr. 1, with 150 members attending. Harold L. Ullrich, Sachs-Barlow Foundries Inc., Newark, vice chairman of the chapter, presided, and W. G. Reichert, president, W. G. Reichert Enginering Co., also Newark, served as technical chairman. The latter, in introducing the principal speaker, pointed out the need of controls for all foundry operations if one is to get the best results from every dollar spent.

Mr. Gitzen stated that a good wash should have the following characteristics: It must mix easily, stay in suspension and not ferment or decompose; should wet the sand surface readily and penetrate to a depth of from 3 to 5 sand grains, should be waterproof; and should have zero permeability with the application of one coat, with two coats seeming to be necessary to secure this result. Also, it must maintain a tough, refractory surface at elevated temperatures; resist cracking from the heat of the molten metal; allow the metal to lie smoothly on the mold surface, hence it must not be

(*Continued on page* 261)

Alcoa Pig and Ingot . . . the best you can buy, because into their production go more years of experience than can be found anywhere else . . . Alcoa's 58 years of making aluminum of exacting quality. *Alcoa Pig and Ingot* are uniform, sound, and free from inclusions. Your assurance, when making mixes, that the next batch will behave just like the previous one. You'll find they're better to start with . . . and your castings are better at final inspection. Easy to order. Just call your nearby Alcoa Sales Office. Or write ALUMINUM COMPANY OF AMERICA, 1823 Gulf Building, Pittsburgh 19, Pennsylvania.

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Experience that reduces costs, saves time, and increases production, impresses the strength, durability and safety of these wafer-thin wheels.

Cutting-off time, reduced from minutes to seconds, proves their speed. The fine finish left on both cut faces, evidences minimized vibration.

The wide range of materials, wet or dry, that these wheels cut so much better, indicates their great versatility

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NORTHERN CALIFORNIA: Group at monthly meeting of Northern California Chapter, AFA, includes, left to right: Harry A. Bossi, H. C. Macaulay Foundry Co., chapter director; William J. Logue, Apprentice Training Service, U. S. Department of Labor; Charles Hoehn Jr., Enterprise Engine & Foundry Co., chapter president; Fred G. Sefing, International Nickel Co., New York, principal speaker; Andrew M. Ondreyco, Vulcan Foundry Co., program chairman; Albert G. Zima, International Nickel Co., Los Angeles; Fred Aicher, E. A. Wilcox Co., chapter secretary

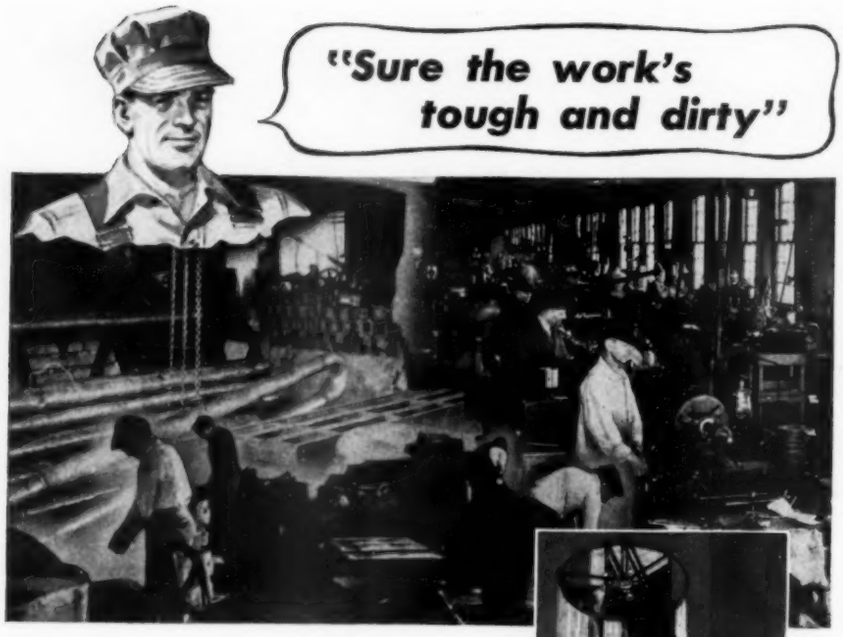
(*Continued from page* 258)

too hard and it must not generate any appreciable amount of gas; and it must not react with the molten metal. In the case of steel, it must not contain an appreciable amount of carbon.

Although the wash manufacturers have, through research and experience, developed materials which will do an effective job, it is up to the foundrymen to see that they are handled according to directions. The use of additions such as clays, molasses water, etc., should be avoided and the proper consistency should be maintained through the use of a hydrometer. The sand to which the wash is applied should be maintained at a uniform level, particularly as to moisture. Sands which have an excessive rate of expansion will crack the wash during drying, while those which collapse too quickly will cause the wash to spall. The latter may result in scabbed particles becoming lodged in the casting metal and in dirty castings. Core joints should be coated with some mudding composition before the wash is applied, if the gas with its resulting blow holes is to be avoided.

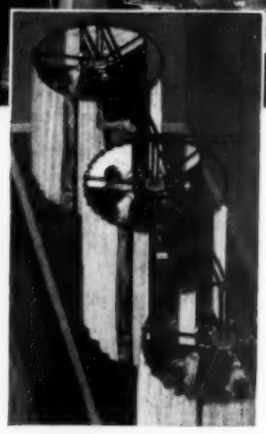
At the request of the members Mr. Gitzen spoke briefly of Delta Permi-bond, a new product developed by his company from a carbonaceous material mined in Utah and intended for use as a facing

CHESAPEAKE: Scenes at recent Baltimore meeting of Chesapeake Chapter, AFA, addressed by N. J. Dunbeck (bottom row center), Eastern Clay Products Inc., Eifort, O. (Photos courtesy Edwin T. Myskowski, Naval Research Laboratory, Washington)



"But when the shift's over, we relax with a shower"

Industrial work isn't easy. There is bound to be dirt, grit, and grease present. These are frequently the reasons why employee turnover in some plants adds up to considerable expense in money as well as retarded production schedules, unless, of course, proper precautions are taken to see that employees' health is protected by the most modern, sanitary and convenient "clean-up" facilities available.



The 5-Stall type Showers illustrated above are equipped with Receptors and can be quickly installed on any floor including wood. Also made in 3-Stall units.

The standard and accepted answer to this problem is Bradley Multi-Stall Showers. Installation of Bradleys has invariably resulted in greater employee satisfaction, more efficiency, and better morale.

In addition to these valuable advantages, Bradley Showers cost less to operate and maintain. They save on water, heating expense, plumbing connections and their regular use reduces lost man-hours due to sickness.

Bradley Multi-Stall Showers come in 5-stall and 3-stall units partially assembled for fast, easy installation in both new and existing buildings. One 5-stall unit needs only three plumbing connections; one for hot water, one for cold and one for the drain—whereas five conventional single-stall showers require 15 supply lines with the extra cost involved in materials, installation and upkeep.

Each stall in a Bradley unit is private, and allows individual control of water with a special constant temperature feature that minimizes the scalding hazards so common in batteries of single-stall showers.

For additional information and floor layout plans, refer to pages 12 and 13 of latest Catalog 4308. BRADLEY WASHFOUNTAIN CO., 2217 W. Michigan Street, Milwaukee 1, Wisconsin.

BRADLEY *multi-stall showers*

For additional information and floor layout plans, refer to latest Catalog 4308.

in the same manner as seacoal.

Discussion brought out the admission that there is no instrument available for determining when a core is fully baked. It still appears necessary to actually break a representative piece and check the hardness while sand is still hot.—*C. J. Law.*

New Jersey

ALTHOUGH foundry practice in Germany was uniformly good, the wartime plants there were far behind those of this country in point of mechanization. Coreblowing machinery was popular with German foundries, but in the main they relied largely upon hand labor.

These and other conclusions were drawn recently by M. T. Ganzauge, superintendent of foundries, General Railway Signal Co., Rochester, N. Y., who was one of a party of experts sent over from this country to investigate German industry. Illustrating his remarks with slides, he spoke before 90 members and guests of the New Jersey Foundrymen's Association at the Newark Athletic Club, Newark, N. J., on March 25.

Because of incessant bombings, German foundries labored under terrific handicaps, particularly during the closing phases of the war. However, some large plants escaped major damage; in fact, in certain instances, completely.

Interestingly, he said the actual peak of steel casting production in Germany was reached in 1944. This was explained in part by the number of gray iron foundries converted into steel foundries after hostilities started. Before the war Germany had 125 steel foundries, the speaker said; this number was augmented subsequently by the conversion of 75 iron foundries to steel.

The Germans used relatively more steel for shells than did the United States during the war. Also, they made many more aircraft castings of steel than did this country, although their losses were substantial, averaging about 20 to 25 per cent.

Finish on German steel castings was poor, particularly on small castings; the finish on gray iron was better and on nonferrous castings was very good.

Cupola practice was much like that in this country, although there was greater variation in coke ratio because of lack of uniformity in coke. Mr. Ganzauge described one type of cupola which had a double row of tuyeres which permitted 25 hours or more of continuous operation.

Equipment requiring castings was far less standardized in Germany, than in this country. As a result foundries had to deal with many more patterns. In response to a question, the speaker indicated

(*Continued on page* 264)

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MORE WORK . . . BETTER MOLDS
in less time

Man-hour production can be increased with the new fast-working Davenport Jolt Squeeze. It is easy to install . . . easy to operate . . . easy to adjust. It is sturdy, compact and built to give years of dependable service.

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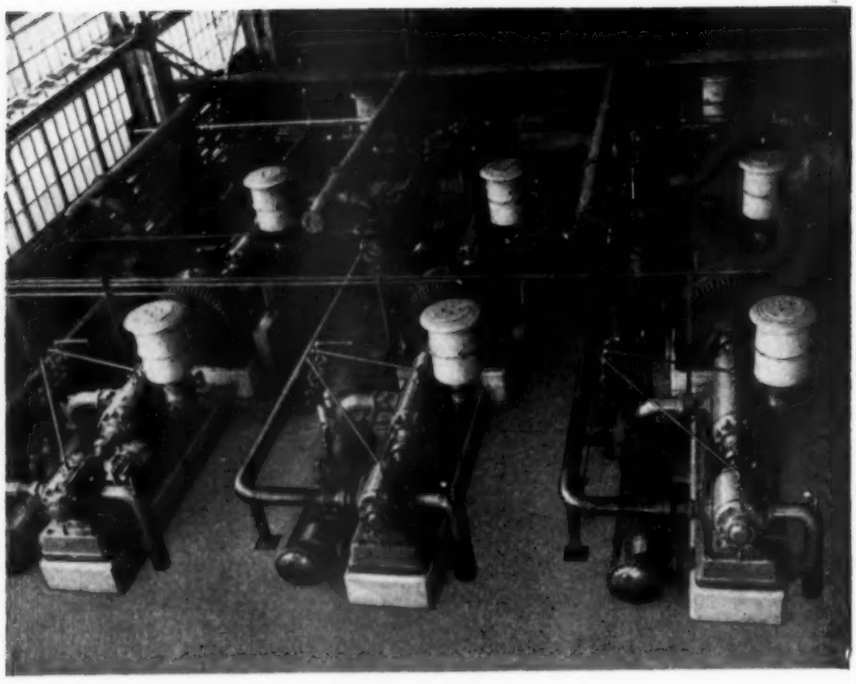
CANADIAN REPRESENTATIVES: CANADIAN FOUNDRY SUPPLIES & EQUIPMENT LTD., TORONTO AND MONTREAL



70 Fuller Rotaries Installed Since 1938

In June 1938, one of the larger manufacturing companies of this country purchased its first Fuller Rotary Compressor. Satisfactory performance of the initial installation has led to many more installations being made in the original plant and plants of affiliated companies. Today 70 Fuller Rotaries are in operation in the various plants.

The machines installed range from single-stage, 40-lb. pressure, to the duplex two-stage, 3300 c.f.m., 125-lb. pressure, three of which are shown in the foreground of photograph above.

These machines will serve them for many years to come. They're built for long life, only three moving parts: rotor — bearings — blades. Also of prime importance — due to their design and construction, *Fullers will continue to maintain original capacities for the life of the machine.*

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C-131

FULLER
PIONEERS OF HIGH-EFFICIENCY ROTARY COMPRESSORS

(*Continued from page* 262)

there was not the bottleneck in machine tool castings that developed here during the war, because Germany started building a machine tool reserve back in 1933 and 1934.

He estimated that perhaps 50 per cent of the labor employed in German foundries during the war was slave labor. In one case, actually 97 per cent was slave labor, and apparently production was satisfactory. Slave labor was paid the same as German workers, although the government took most of it. About 50 per cent of the Russians were volunteers who went into Germany before the attack on Russia, and many of them preferred to remain there after the war.

Mr. Ganzauge touched briefly on German price control as applied to castings. Detailed costs were established on each of the various foundry operations and the government then set up a composite price based on the very lowest cost for each operation.

Price relief, when necessary, first amounted to up to 10 per cent; if this proved inadequate foundries were given relief up to 20 per cent. If, on the other hand, foundries were able to make a profit on the original ceilings, they were permitted to retain as high as 25 per cent profit. However, such high profits were permitted for only a limited time—six months—before ceiling prices were revised. Some foundries managed to fare consistently well throughout the war by turning their profits into more efficient equipment and thus enjoyed additional periods of at least reasonably good profit. The speaker observed that whatever the advantages or disadvantages of the price control system, it was apparently more flexible than that observed in this country. —*Ben K. Price.*

Cincinnati

APPROXIMATELY 175 members and guests attended the Mar. 11 meeting of the Cincinnati District Chapter of the AFA, which was held at the headquarters of the Engineering Society. Chairman A. W. Schneble presided.

Ping Kao-Han, Chinese Industrial Development Co., Chungking, China, a member of the chapter, gave an interesting talk on "Foundry Practice in China." He described the making of several large castings and pointed out that it was necessary for the Chinese foundrymen to build their own equipment, including cupolas, cranes and flasks, before they could make the castings.

Harry Dietert, H. W. Dietert Co., Detroit, was the guest speaker. Mr. Dietert supplemented his talk on "Mold Atmosphere Control" with films showing the effect of various types of atmospheres

(*Continued on page* 268)

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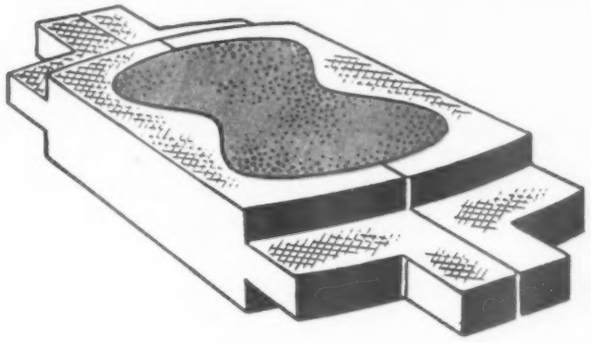
give you *more* for your money



Coresin Oils are no higher in price than ordinary oils yet all the advantages of VELSICOL'S scientific and manufacturing skills accrue to make them superior in basic core oil properties. The net result is fewer rejects and actual lower cost per ton of finished castings for users of CORESIN OILS.

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Metal Structure Greatly Improved by CASTINGS

Famous CORNELL CUPOLA FLUX

IN SCORED BRICK FORM

By using Famous Cornell Cupola Flux, many outstanding foundries have increased the production of dependably sound castings, and are avoiding costly make-overs, for a few cents per ton of metal.

Famous Cornell Cupola Flux shortens heats, makes iron hotter, more fluid, and its cleansing action causes rapid elimination of slag and other impurities.

Castings come sound. No dirt, hollow centers, nor chilled sides. They are stronger, denser grained, more capable of withstanding high pressure--and are more easily machined.

Cupolas are kept clean. Brick is protected in melting zone. Maintenance is reduced. And you always get a clean drop.

SCORED BRICK FORM
Saves Time and Labor, Eliminates Waste.

Famous Cornell Cupola Flux takes but a few seconds to use, promotes accurate measurement—correct quantity of flux per charge.

You simply toss in a brick to each ton or break off a briquette (quarter section) for each 500 pound charge of iron. It does not blow out with the blast but stays in melting zone until entirely consumed.

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Improved— COME SOUND, CLEAN!

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Makes metal pure and clean, even when the dirtiest brass turnings are used.

Castings come tougher, sounder and denser grained, which is vitally essential in the manufacture of any casting that must stand the pressure test and take an extra fine finish.

Several elements in this flux combine to gather the gases, while the metal is being melted, and cause them to form into balloon shaped bubbles and rise to top of metal in the form of slag which is very essential as a cover to retain heat during transfer to molds.

Less tin and other metals are required.

Crucible and furnace linings are kept clean and preserved.

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Famous CORNELL ALUMINUM FLUX

Makes metal pure and clean, and plays an important role in the production of sound, tough aluminum castings.

More scrap can be used without danger of dirt, porous places or spongy spots.

Thinner yet stronger sections can be poured.

NO FUMES! Exclusive formula prevents obnoxious gases, improves working conditions.

Metal does not cling to dross.

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Famous CORNELL LADLE FLUX

Before tapping cupola, place a few ounces of this flux in bottom of ladle. It thoroughly cleanses the iron, bringing any impurities to top of metal in the form of a cake which is easily skimmed off. If molds are some distance from cupola, a handful of our ladle flux sprinkled on top of metal acts as a cover and prevents chilling.

Famous Cornell Ladle Flux keeps ladles clean, reduces patching, increases ladle life.

Attention FOUNDRY EXHIBIT VISITORS!

This being the first peace-time foundry exhibit in five years, we are looking forward to a big turnout and are preparing to give our many old friends and new acquaintances an enthusiastic reception at Booth No. 1936.

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FLUXES

That's right — there is an easy, quick way to reduce the cost and time required for shaking out flasks and freeing castings.

Robins Floatex Shakeouts are "Job-Engineered" to save you man-hours, reduce flask maintenance and replacement, and eliminate unnecessary labor whether your operation is large or small.

A Floatex, for example, can completely shake out an 8-ton dry-sand cope *in only 35 seconds.* What's more, operations like this require only one man instead of the crew previously required.

A note or call will bring a Robins "Job-Engineer" to your desk to help you speed foundry production, reduce cost, and save vital man-hours. Why not get the "Job-Engineered" answer to your problem?

Robins Floatex Shakeouts are made in Portable models for loaded flasks weighing up to 17 tons; in Standard models, up to 100 tons or more—non-discharging and self-discharging types; with and without flask loaders.

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AMERICA'S ONLY COMPLETE MATERIALS HANDLING SERVICE

Hewitt and Robins unite to offer you 136 years of combined experience in "Job-Engineered" rubber products and machinery for every materials handling problem you have.

(*Continued from page* 264)

on metal penetrations. The films were taken in dilatometer and revealed many interesting factors. He pointed out that this type of molding control is new, but with proper application can greatly improve casting finish.—*J. Schumacher, vice president.*

Central Indiana

CENTRAL Indiana Chapter of the AFA enjoyed the opportunity at its Mar. 4 meeting of disproving the old adage that a man is not a prophet in his home town. George Clark, assistant metallurgist, Cummins Engine Co., Columbus Ind., gave an interesting talk on "Alloys in Cast Iron." Mr. Clark has had the experience of having sold alloys and in his present position buys cast iron to specifications which he, as the purchaser, draws up. He developed the important feature that chemical specifications are inadequate and that these must be correlated with physical properties in order to obtain the material to serve the purpose intended.

J. P. Lentz, International Harvester Co., Indianapolis, served as technical chairman of the meeting, and effectively developed considerable discussion.—*B. P. Mulcahy, historian.*

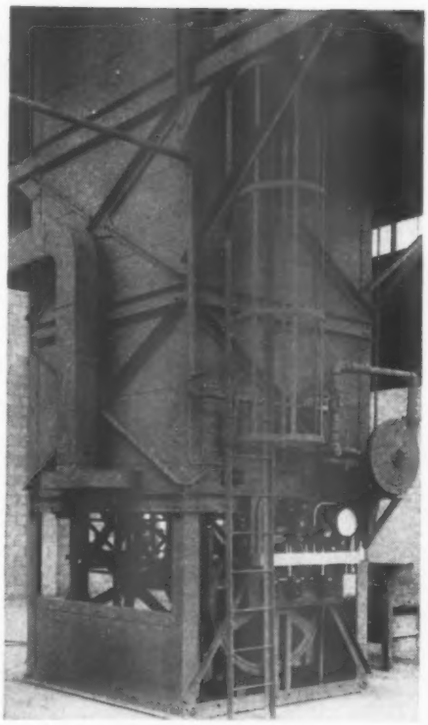
Central New York

APPROXIMATELY 100 members and guests attended the regular monthly dinner meeting of the Central New York Chapter of the AFA, Mar. 8, at the Onondaga Hotel, Syracuse, N. Y. Vice Chairman E. E. Hook presided and introduced the guest speaker, Henry C. Winte, Chief metallurgist, Worthington Pump & Machinery Co., Buffalo, who presented the subject "Gates and Risers for Sound Castings."

Mr. Winte, while recognizing the fact that no one system of gating is applicable to all types and sizes of castings, stated that it is possible to design a system of gating and feeding which will cover a wide variety of sizes and shapes if the principles of directional feeding are carried out. He pointed out that the shrink-bob riser system has been used successfully in producing sound castings and it also reduces cleaning costs considerably.

The speaker stated that the success of any riser depends on its ability to feed hot metal into the section of the casting that is shrinking. The shrink-bob riser design incorporates this feature and is new only in that it more completely describes proper proportions and utilizes the principle of gating through the riser. Mr. Winte presented a series of charts and slides to illustrate that the

(*Concluded on page* 272)



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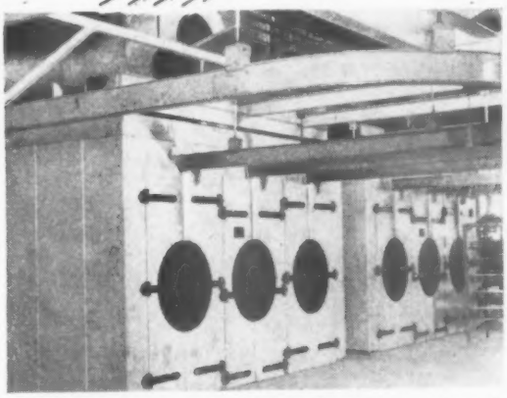
It's Results that count!

CARL-MAYER OVENS PREFERRED by CONCERNS LIKE these:



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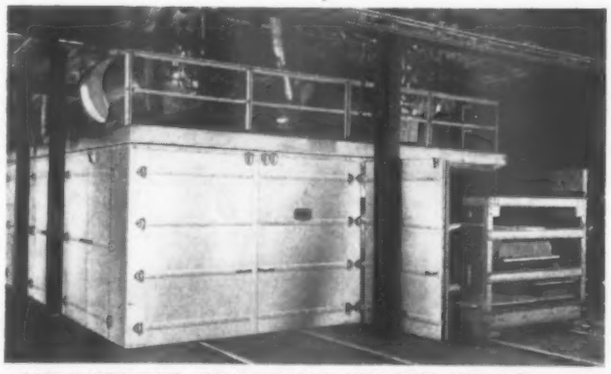

CARL-MAYER TWO COMPARTMENT CAR TYPE OVEN for cores and molds. Also has doors on side permitting its use as a rack type oven.

For over 25 years Carl-Mayer's creative ability has brought forth outstanding developments that have contributed mightily to production and lower operating costs in core and mold departments.

Before you decide on your next foundry oven installation let us show you why leading foundries choose Carl-Mayer equipment.

Write for Bulletin illustrating the extensive line of Carl-Mayer Core and Mold Ovens.

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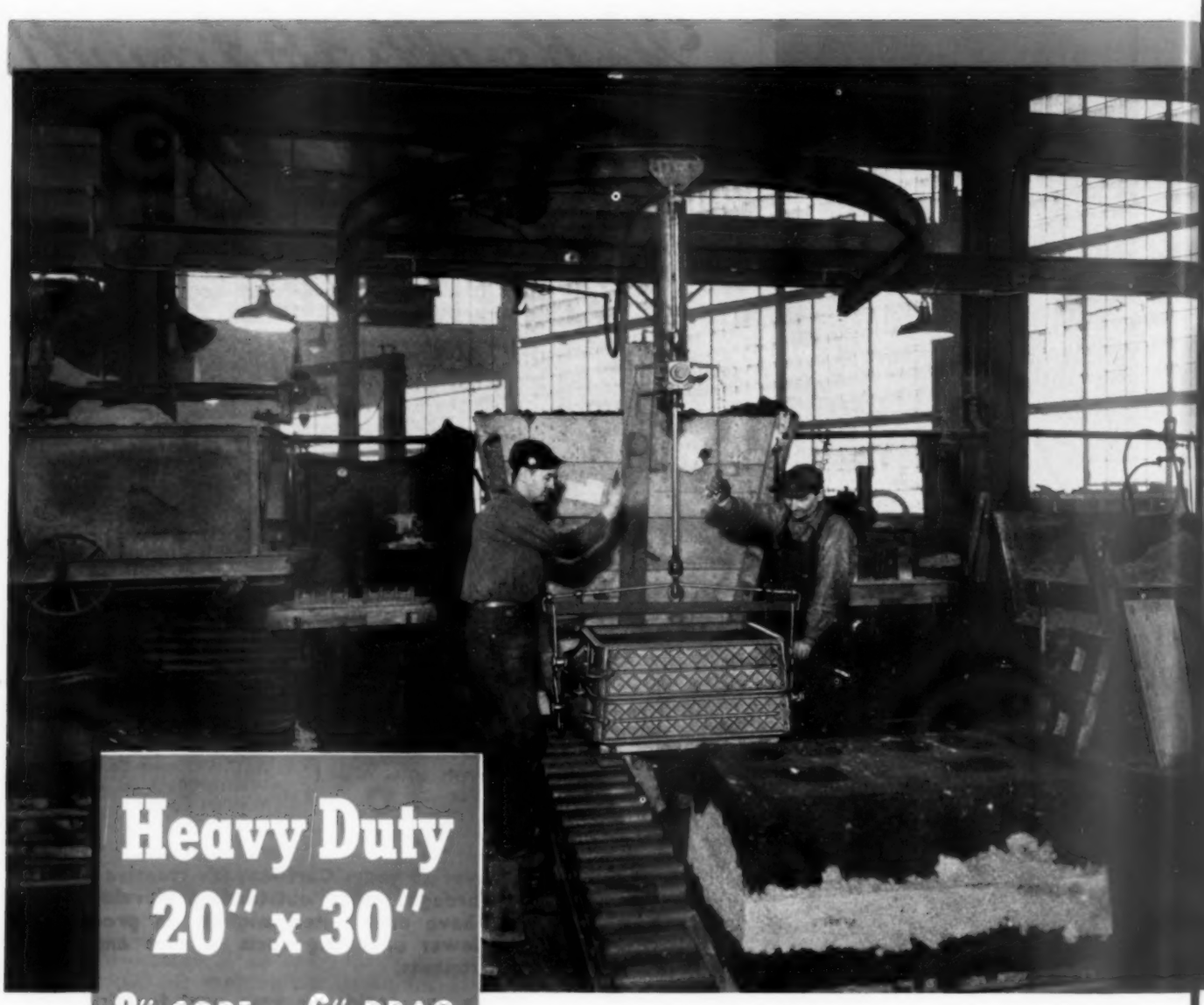
ALL TYPES • ALL SIZES



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EXCLUSIVE BUILDERS OF FLASKS AND JACKET

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★ **Built to stand the gaff of big 16" jolt squeezers.**

★ **Weight is no problem here...the hoists do the lifting.**

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TESSMER MODEL I
Sprue Cutter, without built-in motor drive.

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TESSMER
Sprue Cutters
SAVE
MAN
HOURS

FOR NON-FERROUS FOUNDRIES

Here is the fast, modern, low-cost way to cut sprues and gates on non-ferrous castings . . . the efficient way to step-up volume in your cleaning department.

The Tessmer saves man-hours and cuts labor costs because it does away with slow, tedious hand operations. One swift, sure stroke of the tool-steel cutting knives clips off non-ferrous gates and sprues in a matter of seconds. Highly skilled labor is not required as any workman can run one of these machines at top capacity in short order.

New models of the Tessmer Sprue Cutter, featuring postwar improvements in performance and construction, are now in production. Write for complete description and specifications . . . and arrange to increase the efficiency of your cleaning department.

TWO SIZES

The Tessmer Sprue Cutter is built in two capacities: Model I will cut common brass up to 1¼" square. Model H, designed for lighter work, cuts common brass up to ¾" square. Both are available —

WITH OR WITHOUT BUILT-IN MOTOR DRIVE

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1025 S. 40th STREET • MILWAUKEE 4, WIS.

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(*Concluded from page 268*)

use of proportional gating and risering in the shrink-bob riser system is more successful in producing sound castings than the old hit-or-miss method of gating.—*John A. Feola, reporter.*

New England

REGULAR monthly meeting of the New England Foundrymen's Association was held Mar. 13 at the Engineer's Club, Boston, with 120 members and guests in attendance. The meeting was addressed by H. G. Schlichter, sales manager, Beardsley & Piper Co., Chicago, who discussed "Sandslinger Operations."

Mr. Schlichter added to his talk by showing an interesting film illustrating the use of the sandslinger in various operations in the manufacture of small and large castings. The ramming of a mold by the machine is the heart of the process and the resulting hardness of the mold obtained depends on the type of mold, characteristics of the sand, and operation of the sandslinger. A sand with a permeability of 70-90 and green strength of 6 lb is desirable.

Where soft spots are desirable in the mold a little sand is shoveled in by hand at these points. The better the sand is prepared, the better the results that are obtained. It is not difficult to learn to operate a sandslinger. It requires neither great skill nor a large amount of physical effort. Wear and tear on patterns is normally no greater than that experienced by hand ramming methods and the average mold is rammed from eight to ten times faster by the machine method. For jobbing work a little more skill on the part of the operator is necessary than on production work. Maintenance costs on the sandslinger will be no greater than on any other piece of foundry equipment.

A discussion period followed Mr. Schlichter's address.—*Merton A. Hosmer.*

Connecticut

REGULAR monthly meeting of the Connecticut Nonferrous Foundrymen's Association was held March 20, at the Hotel Taft, New Haven, with a large group in attendance. A color film entitled "Golden Horizons," prepared by the Ampco Metal Co., Milwaukee, was shown during the technical program. The film traces the history of copper and bronze from the Stone Age to the present time, illustrating casting and fabrication of present day alloys.

May meeting of the chapter will be held at the Indian Hill Country Club, New Britain, Conn., May 21, with a golf tournament in the afternoon. Plans for the evening session have not been completed.—*Louis G. Tarantino, secretary.*

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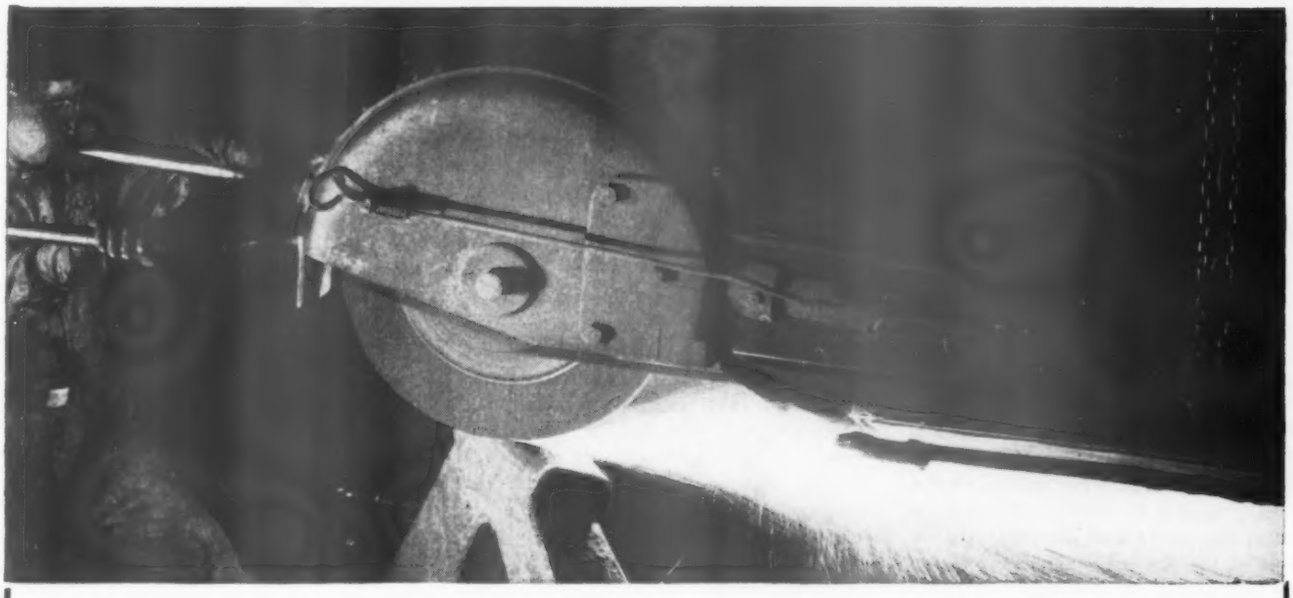

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Let's talk things over!

The UNITED STATES ELECTRICAL TOOL *Co.*
CINCINNATI, OHIO

The Adventures of BILL

By PAT DWYER
Drawings by RICHEY

"WELL," said Bill the other night, "the great day will soon be here and the boys will be rolling in to attend the convention and exhibition. With all travel restrictions off, trains, trucks, boats, jeeps, autos and airplanes will bring in a mob closely resembling a cattle stampede or a buffalo rush in the roaring days of the old West. The housing bureau is going to have a large, splitting headache finding bed and board and an occasional bath for the dignified officers; the earnest young men with brief cases stuffed with papers, photos, charts, graphs, bibliographies and footnotes; the young and old men who attend all the sessions; men in the booths describing and demonstrating supplies and equipment; and a certain proportion, found in every gathering, who came along for the ride. They all share one thing in common and that is every one is connected with the foundry industry in some capacity.

"Locals newspapers will send slightly bored reporters to cover the event, the annual demonstration of an industry that employs over 300,000 people, produces over 10,000,000 tons of castings and does a business of over three billion dollars per year. In the ensuing story, cut down to half a column in an inside page, the public learns that the *iron men* and the steel *puddlers* are holding a convention and exhibition in the Public Auditorium. Usually shortened down to Public Hall by the lads who are a trifle shaky on the spelling and are not quite sure whether the word should begin with an *O* or an *Au*."

"Why the cold and cynical attitude, the pessimistic note?" I inquired, "These newspaper lads, like all workers, may slip occasionally, but they probably have hearts of gold and I am sure you never heard of one shaking his dear old mother." Business here of lifting the hat reverently.

"That's the trouble," the honest fellow protested. 'They are too slippery. I prefer to reserve opinion on the heart of gold and the trick of shaking his mother. I doubt the first and wouldn't put the second past him. However, as you point out with your usual nosey impertinence, this slightly acid condition was brought on by an item in a recent newspaper column. Just goes to show how a man can slip when he ventures into water beyond his depth, or takes a gander through a field where he is not acquainted."

"Did he drag in a reference to the brawny, hairy-chested steel puddlers who were coming to the convention?"

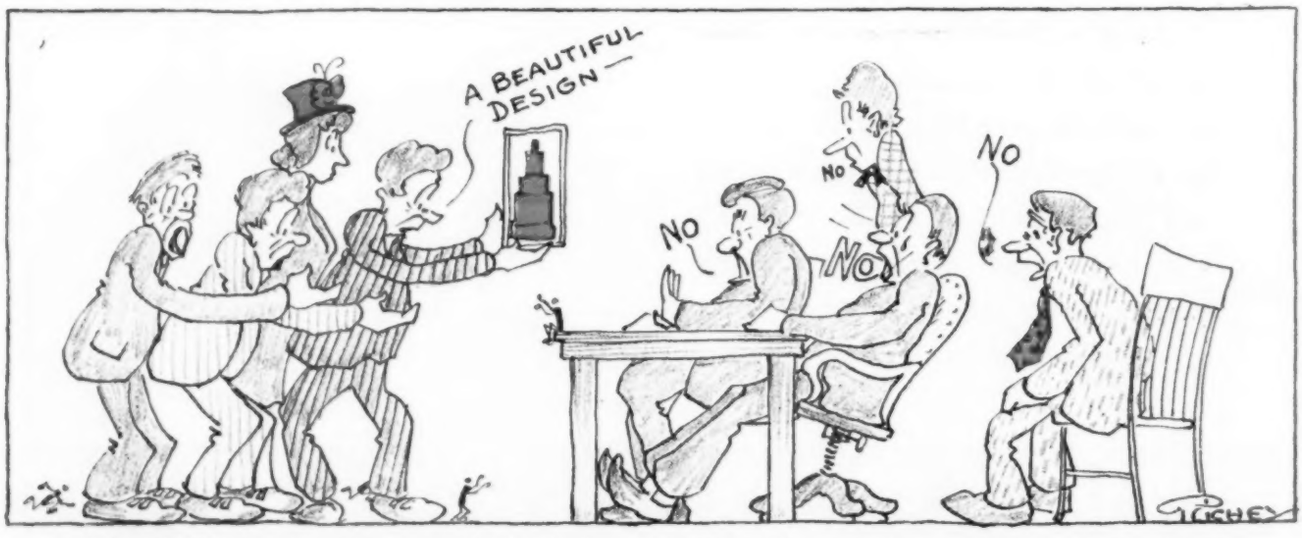
"No, that probably will come later. This here piece which I now hold between the index finger and thumb of my left hand, and which I propose to read for your benefit, reflects the attitude of those outside the fold where metals are concerned. Kindly reserve your questions and comments until I am through reading the extract under the heading *War Memorial*:

Our public squares and village greens have not yet started to break out with a rash of bad statuary, such as marked the ending of the Civil War, the War with Spain, and World War I. But there soon will be an urge for War Memorials just the same, and G. I. Joe will stand beside Johnny Yank, the Rough Rider and the Doughboy of our previous wars. I suppose it is vain to hope that the country will demand memorials that shall be more practical and useful, or even more artistic.

The artistic, in fact, is distinctly not wanted by many of our towns. I cite the case of Provincetown because this case is familiar to me. As is well known that Cape Cod town for many years has had a thriving art colony, an art museum, annual exhibitions and so on. The community is art conscious. When World War I ended and the Selectmen proposed to put up a War Memorial, a committee of artists suggested that their own critical judgment be made use of in the selection of a monument. The town fathers coldly turned the artists down and proceeded to order a (Now get this, if you please—Ed.) to order a cast-iron statue from a foundry that was turning them out cheap. So the lawn of the Town Hall was cluttered with an effigy whose replica may be seen in a score of other towns — a doughboy striding manfully forward, his gun in position to be fired as soon as somebody to fire at appears. • • • There is not much danger, of course, that we shall have equestrian statues this time. But there is a threat of generals in jeeps and Joes in tanks that should be squelched promptly. • • •

"So," I said, "I suppose you immedi-

(*Continued on page* 276)

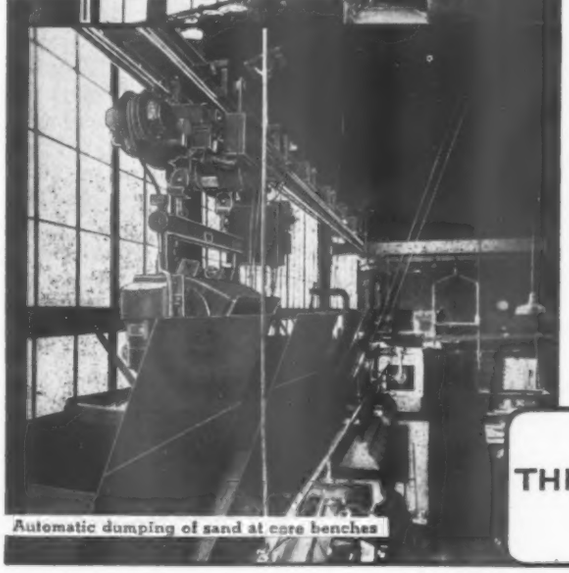


Delegation from artist colony is surprised to find war is fought with guns under rough and vulgar conditions

Automatic MONORAIL System

Loading bucket at speedmuller

Push button control dispatches carrier



Automatic dumping of sand at core benches

DELIVERS CORE SAND TO 9 STATIONS

FROM a simple push button control, operator of speedmuller keeps nine core makers supplied with fresh core sand at all times.

This system operates as follows — Self-dumping bucket is lowered to floor at speedmuller to receive core sand. Operator raises bucket with twin hook hoist, sets the station selector and then presses starter button. The unit runs to the proper station and stops — bucket makes complete revolution dumping sand in hopper — whereupon the unit returns to loading station. All this operation occurs automatically, with no further attention from operator.

This is just another of the many automatic systems designed by American MonoRail Engineers using the American MonoTractor. Let us tell you more about this rubber wheel drive unit. An engineer will consult with you without obligation.

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(*Continued from page* 274)

ately donned the old battle armor, gave the sword and the spear point an extra whet on the grindstone and challenged this careless caitiff to mortal combat. I have had the pleasure of seeing many a good fight start with less provocation."

"Well," said Bill, "I'll tell you. With the exception of the giant figure of Vulcan overlooking Birmingham from Red Mountain, I don't remember seeing any cast iron statue. Vulcan was cast in a Birmingham foundry and set up as a center piece in the Alabama display at the Louisiana Purchase exposition in St. Louis in 1904. The history of his return to Birmingham and resulting shifting around until he finally was perched on top of Red Mountain is quite a story. However, that's neither here nor there. The figure was made up of a great number of pieces cunningly fitted and joined by bolts through interior flanges. I am familiar with several foundries where bronze figures are cast. While I doubted the cast iron reference—well, a man can't be expected to know everything.

"I wrote the author of the column a nice civil letter asking him for the name and address of the foundry which he claimed was turning out cheap cast iron statues to serve as war memorials. He wrote me an equally civil letter stating he never had examined the thing closely but merely had assumed it was cast iron. As to where or by whom it had been made, he had not the slightest idea. The general tone of the letter was Who Cares? And What's the Difference?

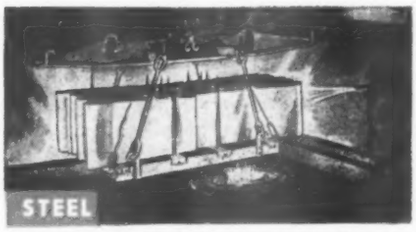
"I wrote to several New England foundry friends—wasn't I the busy little fella?—but no one knew who made the statue. Finally I wrote where I should have written in the first place, to the Town Clerk. Mayors and Selectmen come and and go. They may or may not do credit to their positions. Almost invariably the clerk is a gentleman and a scholar, steeped in the historical lore of the place and with a memory like that of an Indian. He knows everything. In this instance I was not disappointed. He returned my letter with the following prim and precise notation at the bottom: Dear Sir: The statue was designed by Kitson and was cast by the Gorham Co. Cast bronze figure 8 ft, 5 in. high, on a granite base approximately 14 ft., 6 in., high with two Honor Roll tablets, and a dedicatory tablet, all of which are of cast bronze, total cost $11,400.00."

"Under the general head of Good and Welfare at one of the sessions of the coming convention," I said, "You might introduce a resolution expressing—ah—lack of confidence in gentlemen of the press."

"Too many resolutions now. They interfere with the recreation program. I have a mind to throw in the pot an in-

(*Continued on page* 278)

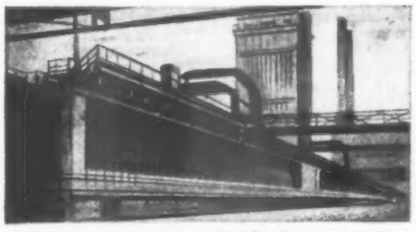
FOR DEPENDABILITY IN METAL CHEMICALS



PICKLING—Sulfuric Acid—Hydrofluoric Acid—Muriatic Acid—Nitric Acid—Phosphoric Acid—Chromic Acid.

Detergents: Sodium Metasilicate—Trisodium Phosphate—Sodium Silicate—Tetrasodium Pyrophosphate.

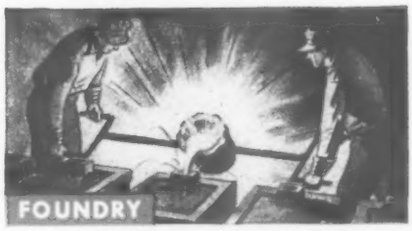
RIMMING STEEL—Sodium Fluoride for smoother-surface rimming steel.



COKE BY-PRODUCTS—Sulfuric Acid for making ammonium sulphate; for washing toluene and benzene, and for treating light oils.

Sodium Cyanide—Sodium Fluoride—Sodium Cyanate—Potassium Cyanate, for heat treating and controlling temperature.

...SPECIFY "GENERAL CHEMICAL"



Casting Cleaning Acid (Hydrofluoric Acid)—Sodium Silicate—Zinc Chloride—Chromic Acid • Ammonium Fluoborate—Sodium Fluoborate—Potassium Fluoborate, Anti-oxidants and inhibitors • Potassium Fluoride—Lithium Fluoride and Other Welding Fluxes • Fluoboric Acid: Solvent for silica, in cleaning surfaces.

Lead Fluoborate—Tin Fluoborate—Zinc Fluoborate—Cadmium Fluoborate—Copper Fluoborate, etc.

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Brass and copper foundries everywhere report they are getting twice as many immersions since changing to Metalast Tubes. This means they are saving on their thermocouple cost as well, for Metalast Tubes are not connected to the thermocouple and can be replaced without damaging or discarding thermocouple.

Metalast Protection Tubes are made of a heat resisting alloy and will stand repeated immersions in molten brass, bronze, aluminum, copper and magnesium. Neither slag, molten metal nor contaminating gases can effect the accuracy of the thermocouple inside, since Metalast Tubes are drilled from special solid stock—without welds, seams or forging. Made for furnace or ladle use—in 6" and 8" lengths with standard ½" pipe thread.

For Full Details Write for BULLETIN NO. 500

ELEMATIC EQUIPMENT CORPORATION
6046 S. Wentworth Avenue
Chicago 21, Illinois

(*Continued from page* 276)

quiry I had recently from a citizen who craved some additional light on the subject of feeding castings through different types of risers. He raises some interesting and in some instances, controversial points. I should like to present it at a session and let the boys kick it around a bit. Are you all ready? Let's go.

" 'We have some tires and wearing plates for a sand muller to make from Ni-hard metal. The tire is 60 in. outside diameter, 8 in. thick and 10 in. face, weight approximately 3400 lb. The wearing plate is in eight sections, each 4 1/4 in. thick, and 17 in. wide, 18 in. across the inner arc and 30 1/4 in. across the outer arc, weight 360 lb. We shall appreciate your opinion on the size, number and style of feeding heads required. We are planning to make the heads in cores to be rammed up with the cope. Within

He always did admire a southpaw

the past few years THE FOUNDRY and other technical papers have presented articles dealing with new methods of feeding castings. In the latest method developed in a British foundry, a small amount of explosive material is placed in the upper part of a closed or blind riser. Metal in the risers fires the explosive and the resulting large volume of gas exerts sufficient pressure to force the liquid metal in the riser down into the casting and thus compensate for the inner shrinkage and contraction of the casting. In a second method atmospheric pressure applied through a small core set in a blind riser forces metal from the riser up into the casting and thus eliminates a shrinkage cavity. In a third method the riser of ample size and shape is connected to the casting by an exceedingly small neck, easily broken off after the metal has solidified.' "

(*Continued on page* 280)

FOUNDRYMEN ALL OVER THE UNITED STATES HAVE DEPENDED UPON THESE FAMOUS DEPOSITS AND OUR RELIABLE SHIPMENTS

Circled on the map is the area of our operation. From Youngstown, Dundee, Geauga Lake, Phalanx and Utica come the fine processed sands that are so well received by American foundrymen. Our PORTAGE, GEAUGA and VENANGO SANDS are adaptable to any foundry practice. COXEY OPEN HEARTH and ELECTRIC FURNACE BOTTOM SANDS have no equal.

WE WILL EXHIBIT AT THE FOUNDRY CONVENTION, MAY 6-10, AS WE HAVE FOR MANY YEARS . . . . .

Uniformity and quality maintained at all times. Shipments of green and dry sands are always made promptly and on time.

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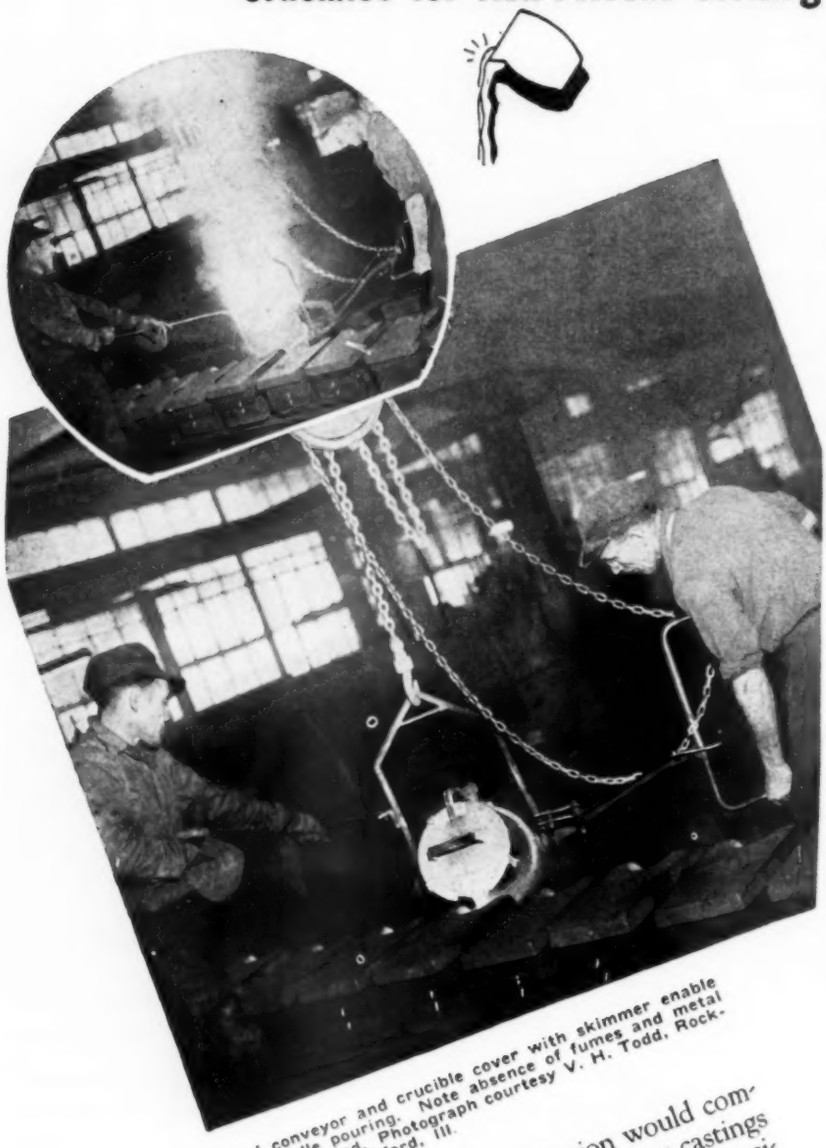
In the heart of the steel Foundry Industry

It is Economical and Efficient to use Crucibles for Non-Ferrous Melting



Overhead conveyor and crucible cover with skimmer enable two men to handle pouring. Note absence of fumes and metal loss when cover is used. Photograph courtesy V. H. Todd, Rockford Brass Works, Rockford, Ill.

For flexibility, a typical installation would comprise large size tilting furnaces for heavier castings and several smaller stationary furnaces with Crucibles used for all pouring. In foundry after foundry, Crucible Melting is daily reducing costs and making the work more easy and efficient. On all nonferrous work, Crucibles can be a profit maker for your foundry.

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CRUCIBLE MANUFACTURERS ASSOCIATION

90 WEST STREET, NEW YORK 6, NEW YORK

(*Continued from page* 278)

"I replied that the subject of feeding castings involves so many ramifications and variables that I hesitated to attempt any reply that would meet the inquiry satisfactorily. Presumably he has read many, probably all, the articles on the subject of feeding castings that have apeared in the THE FOUNDRY and other technical publications in recent years. From this standpoint the inquiry, although tough and hard, still may be regarded as legitimate. On the other hand and from another standpoint, I have a fleeting suspicion, small as a man's hand and all that kind of thing, that he has been listening to a certain radio program and then hatched up the inquiry just to bedevil us generally and see if we were awake or asleep at the switch.

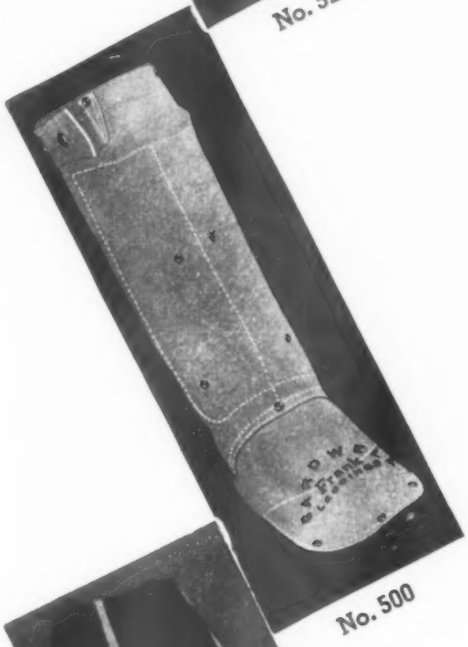
"From published literature and personal observation, also from the fact that the method has been adopted in several steel foundries, one is justified in the statement that the core vented riser is sound in theory and practice. However, so far as I know the method has been confined to the production of steel castings. Experiments with cast iron and bronze, except in the laboratory, have not worked out so satisfactorily. Explanation lies in the fact that steel is a comparatively viscous metal which sets rapidly and forms a skin or protective outside wall which permits the application of atmospheric pressure on the protected liquid metal on the inside. Where this protective skin is not developed practically instantly, the atmospheric pressure is dissipated through the sand. He can draw a line through that method in connection with the tire and liners.

"So many apparently impossible practices have been developed in recent years that one cannot say definitely that this or that can, or cannot, be done. Theoretically the British idea of providing gas pressure on top of a riser seems to be sound enough. However, I doubt the feasibility of application on a commercial scale. A somewhat involved calculation on area, time, temperature and speed of pouring would be required on a floor of miscellaneous molds, and there is neither time nor opportunity for doing this nice bit of calculating while a ladle of metal is hanging from the crane. Also while the work might be entrusted to a skilled mathematician and metallurgist, it would be outside the capacity, and therefore cheerfully ignored by the ordinary operator handling the control lever on the ladle. Following the example of a certain Biblical character I crave an actual demonstration before accepting the statement that the process is worthy

(*Concluded on page* 282)

for highest quality FOUNDRY LEGGINGS insist on . . . . GARDWELL Products

No. 525



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GARDWELL "FRANK" Foundry Leggings are furnished in 22 styles—spat—knee length—hip length—from chrome leather, asbestos, neoprene coated and fire-proofed duck. Some styles are available in rubber for acid work.

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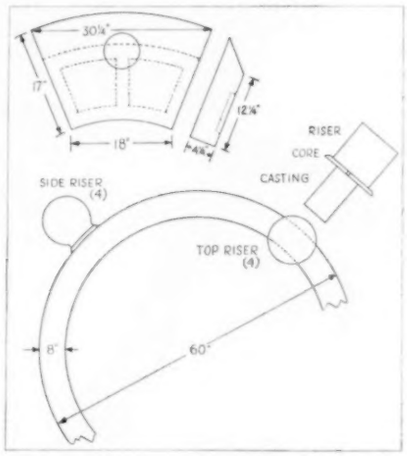
(*Concluded from page* 280)

of consideration in the present connection.

"In the third method we are on more solid ground. The practice of connecting a large riser to a casting by a small opening has been adopted to a considerable extent in ferrous and nonferrous foundries. The connection may be directly on top, or on the side near the top of the casting. Where the top riser is connected to the casting by one small opening in the center, the side riser usually is connected by two to four similar small openings. The risers may



Risers on heavy ring may be placed either on top or at one side

be formed in a core he suggests, but it is not necessary. Ordinary riser blocks may be rammed up in the cope. A thin core print attached to the pattern forms a seat for the thin core separating riser and casting with the exception of the small connecting passage.

"For the wearing plate a single riser 6 in., diameter and 8 in., high, directly over the center, or at the side of the inside face will serve. Two risers 9 in., diameter and 10 in., high might serve on the tire, but four supply the desirable insurance factor. The accompanying sketch is self explanatory."

Metal Show Planned For Atlantic City

Atlantic City has been selected as the site for the 28th National Metal Congress and Exposition, to be held the week of Nov. 18. The congress is sponsored by the American Society for Metals in co-operation with the American Welding Society, Iron and Steel and Institute of Metals Divisions of the American Institute of Mining and Metallurgical Engineers, and the American Industrial Radium and X-Ray Society. Upper and lower levels of the Atlantic City Municipal Auditorium will be used for exhibit space.

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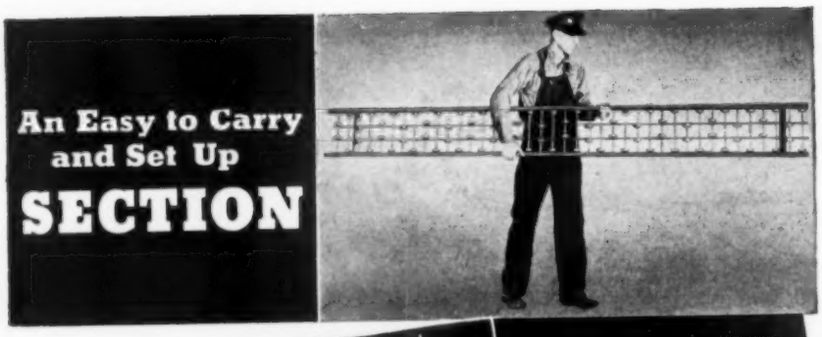

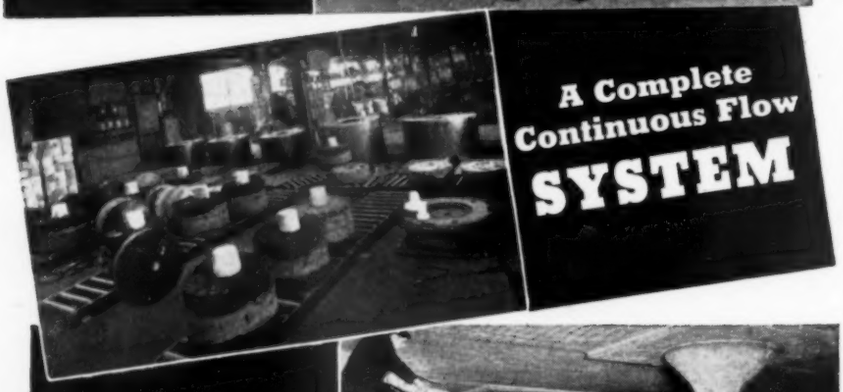

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FLAME HARDENING CAST IRON

(*Continued from page* 155)

flame can raise the temperature of the outer skin of the area to be hardened far in excess of the process requirements. Such an occurrence would be especially possible if a hard case of maximum depth was required. Because of this fact, it is advantageous to employ as little heat as possible and still fulfill the requirements.

Iron castings, owing to their usual design and to the physical characteristics of the solidifying metal, often contain considerable stresses, especially in the high strength types. Such castings should be given a stress relief treatment at as high a temperature as the particular metal will withstand without a structural change, before flame hardening. Some of the irons considered here will withstand a stress relief treatment as high as 1200 F before the selective hardening. The methods of manufacture of iron castings allow for rather rapid section changes, and when flame hardening is applied the depth of case might increase considerably with a decrease in section. In this way many stresses are produced and they may lead, in the most drastic instances, to cracking. It is preferable, therefore, that the section be uniform and that any excess metal be removed after the completion of the flame hardening and a possible subsequent stress relief treatment.

Recommend Stress Relief

There are great differences of opinion as to the benefits obtained from a low temperature stress relief after hardening, and many iron castings have successfully been put into service with no such treatment, in order to retain maximum hardness. However, in some applications where the flame hardened case ends in an area of tensile stresses, a stress relief treatment is recommended because of the change from compression to tension stress in a rather narrow range. Sefing[1] states that a reduction of 25 to 40 per cent of the stresses set up by flame hardening is possible with a stress relief anneal of 300 F.

Compared with the more common methods of heat treating cast iron, flame hardening usually presents fewer problems of distortion or warpage. This is primarily due to the fact that in most instances of flame hardening only a relatively small portion of the entire casting is subjected to temperatures at which distortion would take place. However, even though only a thin case on the surface of castings is affected, all precautions and steps which have helped to

(*Concluded on page* 286)

SWINDELL *constructs exacting*

ELECTRIC ARC

MELTING FURNACES

for maximum, economical

STEEL PRODUCTION

Swindell Electric Arc Furnaces meet the exacting needs of today's steel makers! When equipped with Westinghouse Rototrol Controls, Swindell furnaces provide smoother operation, complete automatic regulation during the entire heating cycle, minimum maintenance and maximum production. Swindell engineers will gladly aid in solving *your* industrial furnace problem.

SWINDELL-DRESSLER *Corporation*

DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES

PITTSBURGH, PA.

(*Concluded from page* 284)

eliminate warpage in other methods of heat treating can usually be applied advantageously to flame hardening of gray iron.

In many cases flame hardening is selected to keep distortion at a minimum not possible in full hardening processes. Of course, there are limitations in the flame hardening of iron, as there are in the other processes. For instance, many iron castings are small enough so that a full hardening treatment would be more economical than flame hardening even though the selective method would be quite satisfactory. However, it has been found on the average that in many cases flame hardened iron castings cost less for a given hardness than those treated by other methods.

Compared to such other methods of selective hardening as induction, the flame hardening method has certain advantages. For instance, the application of the flame hardening process is not limited by intricate contour or large mass as is often true in the case of the induction method. Furthermore, the capital investment for a flame hardening setup is considerably less in most instances than that for induction hardening equipment.

Quenching Is Possible

Selective hardening works in such a way that drastic quenching is possible and often occurs. In fact, at times the quench may be so drastic that considerable amounts of austenite are retained, especially in the outer layer. In extreme cases, the percentage of this retained austenite might be so high in relation to the martensite that hardnesses considerably lower than those anticipated may result. Under these conditions the material might be condemned on the basis of poor hardening characteristics which it does not necessarily possess. Actually, a change in quenching procedure might eliminate the trouble and show that the material is entirely satisfactory.

The flame hardening of machine tool ways is one of the outstanding applications in the field of gray iron. Many other machine tool parts and jigs and fixtures are hardened to maintain close tolerances during subsequent use, by reducing the possibility of gouges or scratches. Fig. 5 shows grinding machine fixtures which are a typical application of flame hardening to machine tool parts cast of pearlitic iron. Fig. 7 gives further evidence of the versatility of the flame hardening process as applied to iron castings.

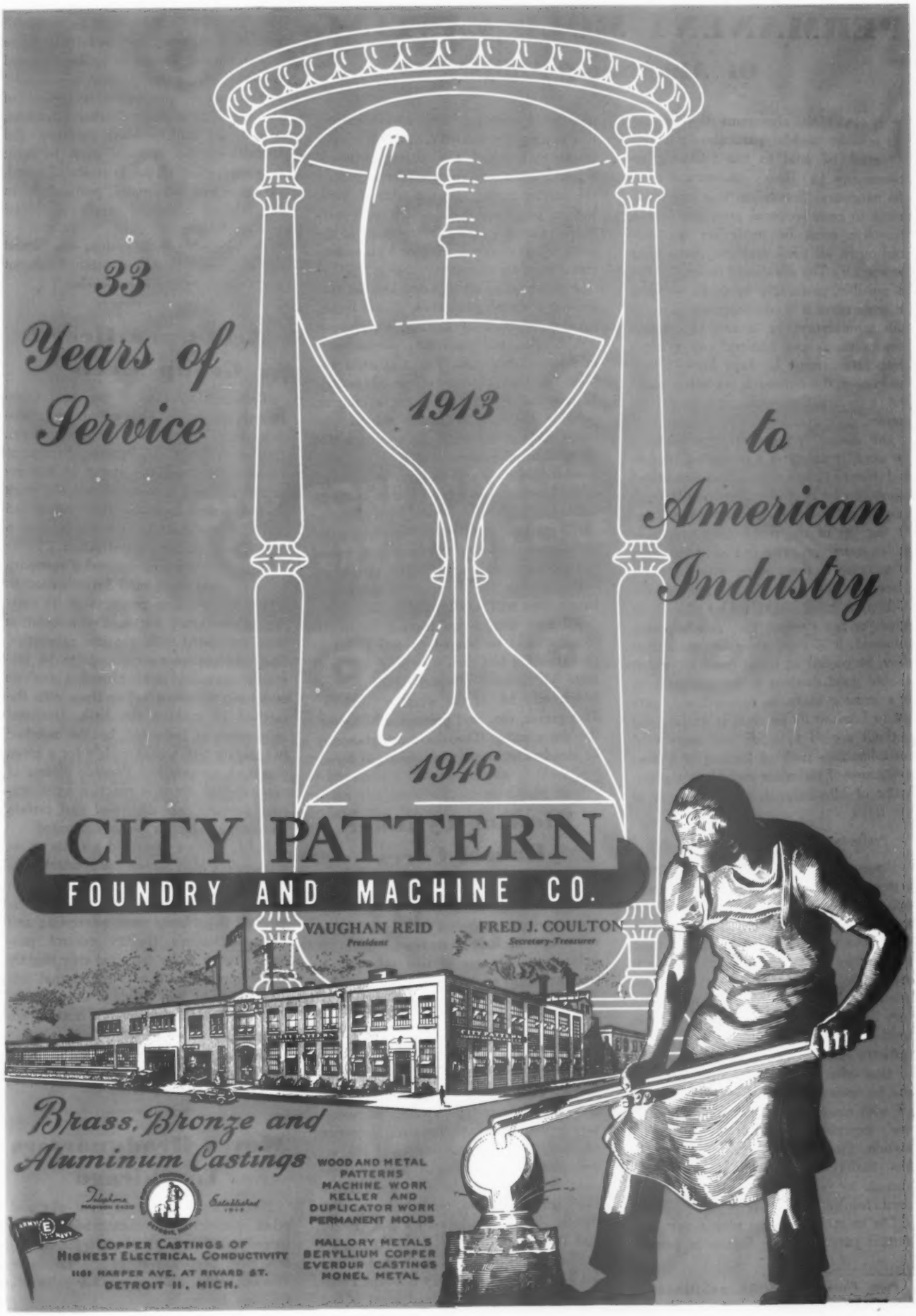
Reference

1. "Flame Hardening of Cast Iron," by Fred G. Sefing, *Iron Age*, Oct. 19, 1939.

Above: Type N 10 lb. Laboratory Unit. Below: 3-Type LFY 700 lb. production furnaces.

With a Type N, 10 KW, 10 lb. Laboratory Detroit Rocking Electric Furnace you can develop new alloys and melting techniques necessary to producing castings of desired characteristics in production. Rugged and compact, this efficient little pilot plant is engineered with all the proven Detroit Electric Furnace advantages, including the well known rocking action. When melting practices are established they can be duplicated in larger units under most desirable working conditions. Our engineers will be glad to study your melting requirements and advise how Detroit Rocking Electric Furnaces can speed quality metal melting in your plant.

DETROIT ELECTRIC FURNACE DIVISION
KUHLMAN ELECTRIC COMPANY • BAY CITY, MICHIGAN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PERMANENT MOLD CASTING

Of Aluminum Alloys

IN CASTING aluminum alloys in permanent molds particular attention must be paid to the following requirements. (a) Heavy runners and risers are necessary; "heavy" in this connection refers to cross-sectional area, not height. Provision must be made for adequate feeding of all thick sections, particularly bosses. (b) The die should be kept as hot as possible, preferably by quick working. In some cases it is advantageous to maintain temperature by means of external heat, such as gas burners. (c) Pouring temperature must be kept low—if misruns occur, the remedy is not hotter metal but a hotter die, with perhaps an increased gate opening.

Die design in relation to the alloy to be used, is mostly a question of runners and risers. Castings in aluminum-silicon alloys can be poured successfully through narrow gates and small runners situated at the top of the mold. Other types of alloys usually require one or more risers in addition to the runner, with the latter placed at the casting's heaviest section. Although gates ought to be placed on edges or faces where they can be easily removed, it is even more important that they be placed at those positions which enable good castings to be produced. It is a great mistake so to position a gate solely because its removal is simple, and without regard to other and more vital considerations such as feeding of bosses, avoidance of turbulent metal entry, possibility of blowholes due to formation of air traps, etc.

Preliminary Experiment Necessary

Cross-sectional area of a runner or riser is important. If not massive enough, it will fail to perform its proper function of remaining liquid and providing a reservoir of molten metal from which the casting proper may draw. Shrinks and cracks will result. On the other hand, it is uneconomical to go to the extreme of relying on very heavy sections in every case, because production is seriously retarded if the operator must wait an appreciable length of time after each cast before the mold can be opened. It is good practice to start off with runners, etc., rather smaller than one's experience or judgment deems advisable, then increase gradually after a few trials until they prove just large enough to produce consistently the desired results.

Die or mold coatings play a very important part in the production of permanent mold castings. This means coating the casting cavity with a more or less refractory material. For coating purposes, runners and risers are considered part of the casting cavity, also the ends of cores, bushes, plugs and slides which form parts of the casting. In short, any surface of the mold which comes in contact with molten metal must be coated.

A die coating should develop the following essential properties: Good finish, easy withdrawal of casting, progressive solidification and maximum output with minimum labor cost. For maximum results "differential coating" is suggested. Differential coating equalizes as far as possible the rate at which the molten metal cools in the mold. To approach the ideal state of uniform cooling, thin sections should have a thick layer of coating, while heavier ones receive a thin coating. Likewise, with runners and risers whose chief purpose is to remain molten after the casting has set in order to supply extra metal to compensate for liquid shrinkage —the thicker the layer of coating the longer they will stay liquid.

All new dies, when leaving the toolroom, should be heated to 450 F for a period of not less than 4 to 6 hr, to eliminate all grease, oil and other matter which may be on the working surfaces. This grease, etc., will prevent adhesion of the die coating. The die coating should be evenly distributed over the mold form.

From *Fluxations*, No. 14, published by Foundry Services Inc., New York.

Blowing Cylinder Barrel Cores

(*Concluded from page* 173)

sliding the light-weight boxes across the inner conveyor requires little effort. The roll-over bail clamps onto the box through holes in the center of two side plates, permitting it to be rolled over easily. Another operator is stationed outside the conveyor just beyond the draw stations to inspect cores before they are removed for dipping and baking.

A fairly complicated system of interlocking controls, central feature of which is a large drum-type switch, is necessary to maintain a synchronized sequence of operations. All movements of the index conveyor, blow unit and squeeze unit, are controlled by air under 120-lb line pressure. The outer conveyor is driven electrically through a 3-hp motor and Reeves drive.

Speed of the unit is such that a carload of sand is used every 8 hours. Properly mixed and conditioned sand is fed into the blow unit through an overhead system, and seals are such that there is a minimum amount of spillage around the coreblowing installation.

The entire installation is typical of the trend in high-production foundries, where the skill, manual dexterity and strength of the operator must be built into equipment in the interests of speed, precision and uniformity, particularly in the face of the scant supply of skilled foundry labor.

Development of the system was carried on in conjunction with technicians of the Osborn Mfg. Co., Cleveland.

Acid Open Hearth Group Meets

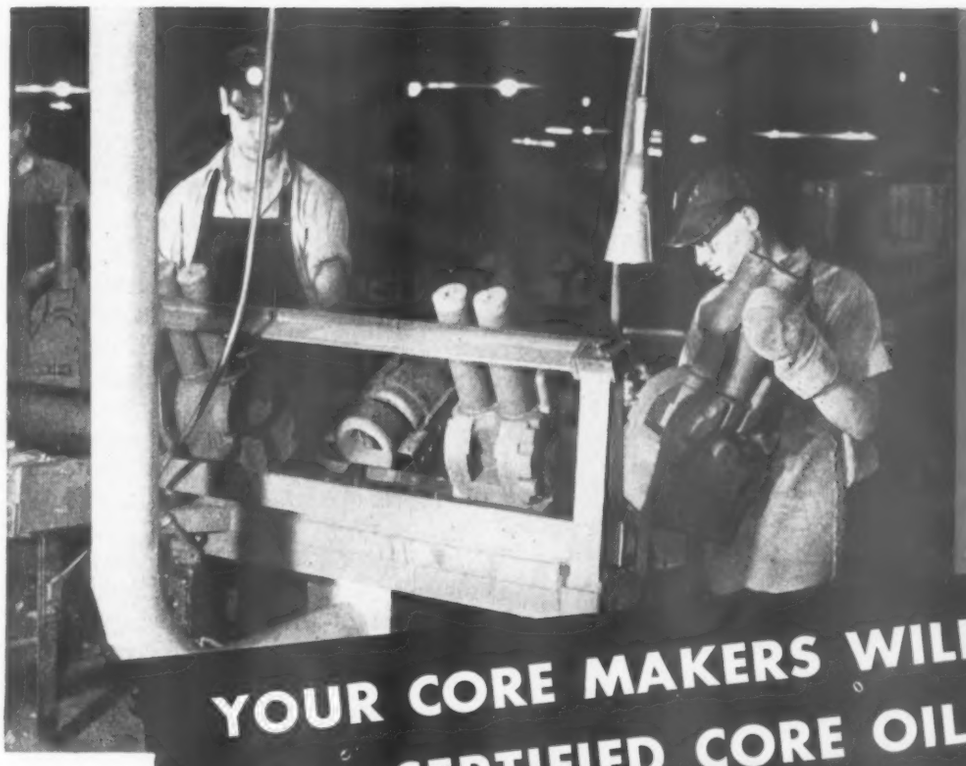
Technical meeting of the Acid Open Hearth Research Association Inc., was held Mar. 11, at the Roosevelt Hotel, Pittsburgh. Dr. G. R. Fitterer, director of research, outlined the status of the research program and stated that the work on low carbon heats has been completed and that the staff is now engaged in a new high carbon investigation.

B. B. Rosenbaum presented a summary of a recently completed investigation in which the working practices of 34 casting grade heats within the association were correlated with physical properties. Static properties were shown to be primarily associated with chemical analysis and heat treatment rather than with the method of making the heat. Dynamic properties, as indicated by the notched bar impact test, varied widely for a given chemical composition. Possible effects of variations in furnace practice upon impact strength was discussed and certain interesting relations were illustrated.

J. W. Linhart described a series of six consecutive high carbon heats which constitute the start of a new high carbon research program. "Melting-in" characteristics of these heats were interesting and the association's fluidity control procedure needs to be modified only slightly to be applicable. It was found that this plant already had applied the association's fluidity control and heats were quite uniform in many respects. Certain recommendations were made to the plant in which these heats were made which will reduce refining time.

Moves Headquarters To Chicago

Penola Inc., sellers of core oils and other petroleum products, has discontinued its office in Pittsburgh. Headquarters have been moved to the La Salle-Wacker Bldg., 221 North La Salle St., Chicago 1.



It will be a pleasure to meet all our friends at our exhibit at the A.F.A. Convention, Cleveland, May 6th to 10th, Booth 502.

YOUR CORE MAKERS WILL LIKE CERTIFIED CORE OIL

The men responsible for core quality and uniformity readily appreciate the advantages of Certified Core Oil, when given an opportunity to test a grade we recommend for a foundry's specific conditions.

Certified Core Oil is known the nation over for keeping core makers satisfied, because of its smooth working in the core boxes, its uniform quality and because of its ability to prevent sand from crusting so readily when left lying on the benches. In addition to core makers, other workers throughout the foundry like Certified Core Oil because:

It provides cores that shake out easily.

Lowers cleaning costs.

Makes smooth castings.

Reduces gases during pouring.

A combination of these savings spells less cost per-ton-of sand mixed.

The successful, extensive and ever-growing use of Certified Core Oil is due in large measure to our policy that "Core oil should be prescribed."

Tell us the grade and number of core oil you use, your type and mesh of sand, and your oven conditions. We will prescribe your ideal core oil.

IN ONE OF THESE GROUPS YOU WILL FIND YOUR IDEAL CORE OIL:

CERTIFIED GOLDEN CORE OILS, identified by their color, are made from the most select raw materials. Usually termed "conventional core oils."

CERTIFIED UNIQUE CORE OILS give the same results as our Golden Core Oils, but are made from off-colored materials which are dark in color and cost much less.

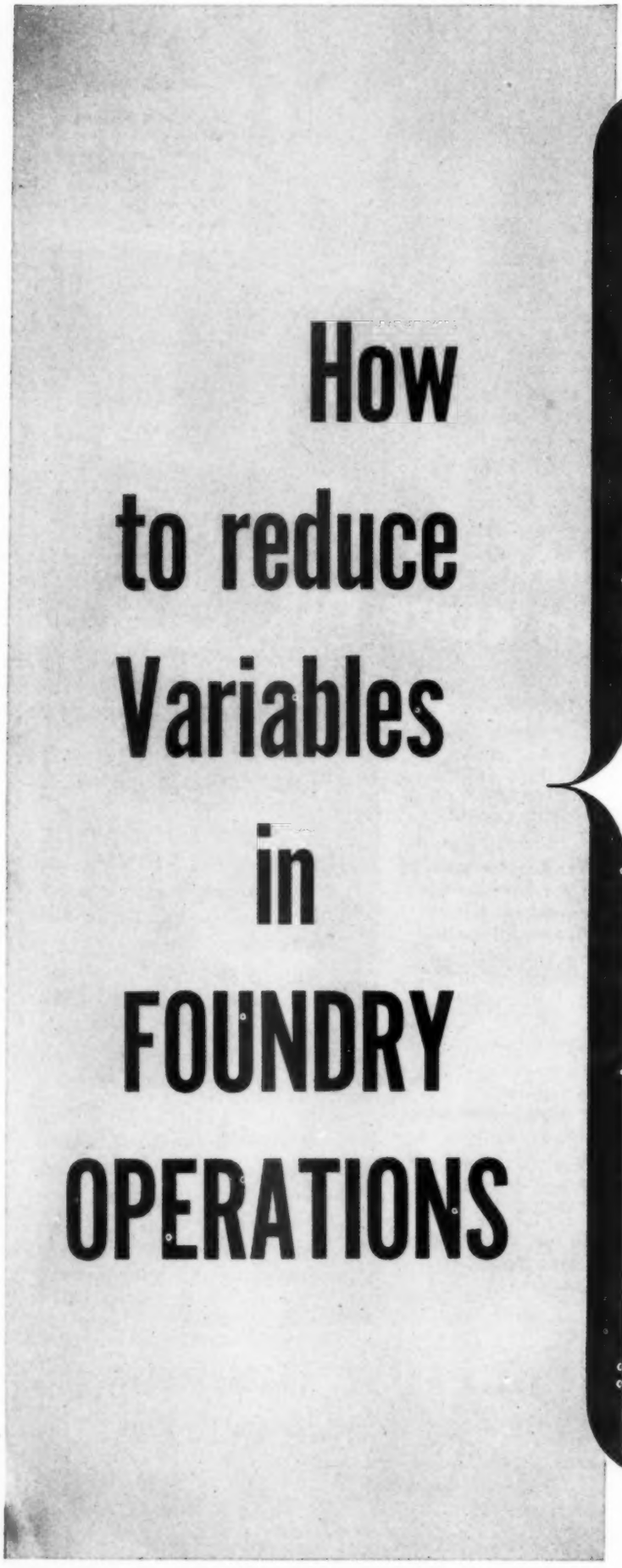
CERTIFIED RAPIDRY CORE OILS, also dark in color, are considerably lower in price. They bake quicker in the oven or at a lower temperature and provide more readily collapsible cores.

CERTIFIED CORE OIL DIVISION
SOCONY-VACUUM OIL COMPANY, INC.

3308-26 South Cicero Avenue, Cicero, Illinois

Stock and representatives:

Buffalo, N. Y.; Elmira, N. Y.; Worcester, Mass.; Bloomfield, N. J.; Reading, Pa.; Sunbury, Ohio; Milwaukee, Wisc.; St. Louis, Mo.; Minneapolis, Minn.; Birmingham, Ala.; Houston, Tex.; Denver, Colo.; San Francisco, Calif.; Portland, Ore.



How to reduce Variables in FOUNDRY OPERATIONS

Here are factors responsible for greatly improved cupola melting conditions:

1

A marked exothermic reaction resulting from the thorough deoxidation by FERROCARBO briquettes produces a super heated iron. "Quick-setting" is eliminated—better fluidity is promoted. And this fluidity is further increased by the removal of the dissolved iron oxide from the molten iron. "Improved life" is imparted to the metal.

2

Consistently hotter iron is produced by the heat evolved in these deoxidizing reactions. Cleaner, sharper castings can be poured. Misruns, draws, porosity and other similar defects are appreciably reduced.

3

The vigorous deoxidizing action you get from FERROCARBO briquettes effectively compensates for the many variables in cupola operation—variables caused by changes in the chemical and physical condition of the charge, atmospheric humidity, height of coke bed, blast volume, melting rate, etc. Thus, a more uniform iron with better control of the silicon and carbon contents is assured.

4

With FERROCARBO briquettes there is a strong graphitizing effect which permits the successful melting of lower carbon-silicon high strength irons. Or, more cast iron or steel scrap can be utilized with consequent economies. At the same time excellent machinability is secured. These irons are tough and dense, free from "open grain" or internal shrinkage defects.

5

The recoverable silicon is an important item also in the profitable use of this unique deoxidizing and inoculating agent.

Complete, detailed information on the use of FERROCARBO briquettes in your operation will be gladly furnished by our metallurgists. Write Dept. L-56, The Carborundum Company, Refractories Division, Perth Amboy, N.J.

THIS PROVEN CUPOLA INOCULATING AGENT

- Is simple to use—economical in cost.
- Produces inoculated irons by a unique and proven method.
- Gives super-heated iron of greater fluidity.
- Provides superior deoxidation.
- Improves structure.
- Improves physical and mechanical properties.
- Improves machinability—fewer rejects.
- Increases wear resistance.
- Reduces effect of foundry operating variables.
- Promotes uniformity and reproducibility of structure and properties.

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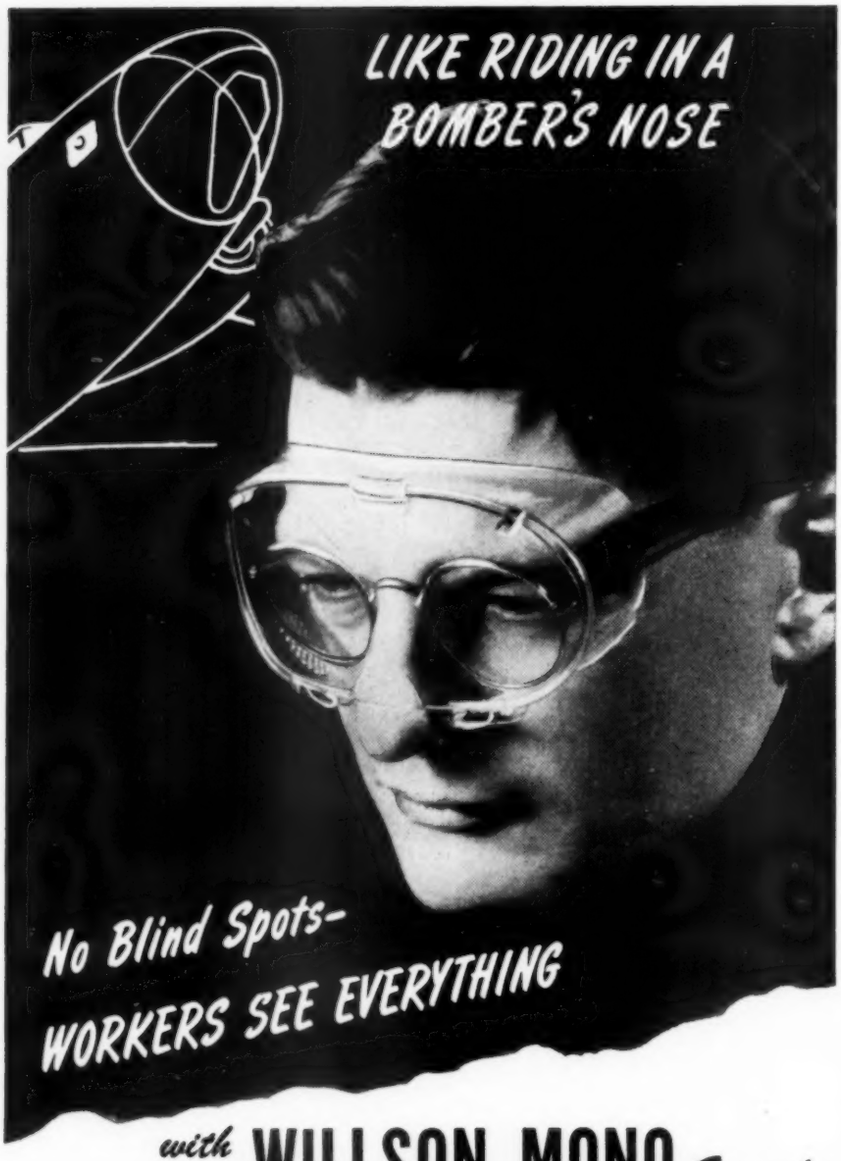

with WILLSON MONO Goggle

Clear or Willson Tru-Hue Green lenses. Clear, frosted or green frames.

Lens anchored firmly in frame but is easy to remove and replace.

The large, one-piece, plastic lens permits full view vision without distortion. With integral nose piece, the Mono-Goggle provides overall eye and nose protection against the hazards of chipping, grinding, spot welding and similar jobs. Under test, the lens resisted frontal impact of a steel ball traveling 225 ft. per second.

Eyes say, "Satisfied," behind MonoGoggles because it is styled for day long comfort. It is light in weight (just over an ounce). A smooth rolled edge conforms to facial contours and an adjustable headband holds the goggle snug without pressure. And it can be worn in comfort over prescription spectacles.

MonoGoggle is made in standard and extra large sizes with 2 nose sizes; curved and flat lens styles; ventilated or non-ventilated frames.

For help on your eye protection problems, get in touch with your Willson distributor or write to 237 Washington St.

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DOUBLE WILLSON PRODUCTS INCORPORATED

READING, PA., U. S. A. Established 1870

WILLSON 75 YEARS

OBITUARY

THOMAS KAVENY, president of the Herman Pneumatic Machine Co., Pittsburgh, since 1915, died March 29, in Canandaigua, N. Y. Mr. Kaveny was sales manager of the N. K. Fairbanks Co., Chicago, for 17 years, before he became associated with the Herman Pneumatic Machine Co. A native of Canandaigua, N. Y., he received his early education there, later attending Canandaigua Academy and Cornell University, from which he was graduated with a degree in engineering. He was a member of the American Foundrymen's Association and at one time served as one of its national directors.

• • •

William Shennan, 84, consultant in foundry sands for M. R. Taggart & Co., Phildelphia, since 1923, died Mar.11, at his home in Bethlehem, Pa. Mr. Shennan started his career as a foundryman in 1881 with Bethlehem Iron Co., predecessor of Bethlehem Steel Co. He retired in 1923 as superintendent of iron, steel and brass foundries, pattern shop and pattern storage, of the Behlehem plant of Bethlehem Steel Co. Mr. Shennan was a member of the old Philadelphia Foundrymen's Association and later of the American Foudrymen's Association.

• • •

George A. Renwick, 62, general foreman of the Sacramento foundry of the Southern Pacific Co., San Francisco, died Feb. 27, in that city. Mr. Renwick joined the company at the age of 16.

• • •

N. C. Hilton, executive manager of the abrasive and diamond wheel departments of Raybestos-Manhattan Inc., Manhattan Rubber Division, Passaic, N. J., died Mar. 14, in Glen Ridge, N. J. Mr. Hilton had been associated with the company for more than 30 years.

• • •

George Robb, 49, sales engineer in the Los Angeles territory for Federated Metals Division, American Smelting & Refining Co., died suddenly Mar. 8, while attending a meeting of the Southern California Chapter of the American Foundrymen's Association.

• • •

Herbert W. Gledhill Sr., 63, vice president of the Shepard Niles Crane & Hoist Co., Montour Falls, N. Y., died Mar. 2, at his home in Watkins Glen, N. Y. Mr. Gledhill had been associated with the company for 35 years.

• • •

Robert L. Quisenberry, 76, one of the founders of the Monarch Foundry & Engineering Corp., Stockton, Calif., died Feb. 27 at his home in Pacific Grove.

You will profit by a trial of these products!

Steel SHOT AND GRIT

Our Exclusive Scientific Heat Treating Process puts 20th Century Blast cleaning abrasive in a class by itself for slow wear. The way it holds to its size range is amazing. This is important because the slower the wear the better and more economical the results.

Made in many sizes. Write for Samples and Price List.

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CLOSER SCREENED by Rotap tests. Besides, it has the right quality to insure slow, even wear and avoid shattering.

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Geo. Grant, 6621 Maryland Dr.

BRANTFORD, ONT., CANADA
C. E. Windrim, 310 Wellington St.

NEW BRASS FOUNDRY IS OF MODERN DESIGN

(*Concluded from page* 163)

time, or on a thin abrasive disk. A local addition to the machine is a swinging light-steel chute into which the operator drops each casting. The chute discharges into a pan slightly below floor level. When the pan is loaded it is lifted by a pulley and cable combination and the contents are dumped into an airless blast cabinet where the castings are tumbled and blasted and thoroughly cleaned. They are then taken to the double stand grinders, where all remaining vestiges of fins and gate stumps are removed. From this point they are trucked into the machine shop for extensive machining, fitting, assembling and later to a bath where they are chromium plated and made ready for shipment. These extremely interesting and important operations lie outside the scope of the present description.

The coreroom adjoining the foundry, from which it is separated by a concrete block wall, is equipped with five coreblowing machines and several benches on which certain cores are made by hand in the usual manner. Cores made on the machines emerge as complete units. Cores made on the bench are made by packing sand in two half boxes and then *booking* the halves by first bringing them together in a vertical position and then lowering the assembly back on the bench. One half of the corebox is removed and replaced by a dryer shell designed to support the comparatively fragile core and prevent distortion while in the green or semi-green stage. The entire assembly again is rolled over and the second half of the corebox is removed, leaving the core in the dryer.

With the exception of the booking item, the cores from the coreblowing machines are handled in the same manner. The cores are held to close tolerances to insure an even distribution of metal thickness in the castings. They are dried in a vertical type oven, where they are loaded at floor level, carried aloft through heating zones up to a maximum of 450 F and then lowered through zones of diminishing heat to the ground floor, where they are removed and taken to the finishing and inspection benches. The sand is a mixture of fine silica sand and bank sand bonded with oil in a paddle type mixer.

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From any one of the locations shown below . . . you can get prompt shipments of Schundler Bentonite . . . a first quality foundry Bentonite.

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Los Angeles, Calif.	F. E. Schundler Bentonite Co. (Inc. of California)
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Oklahoma City, Okla.	Barada & Page, Inc.
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Portland, Ore.	Miller & Zehrung Chemical Co.
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San Francisco, Calif.	Ind. Fdry. Supply Co.
Seattle, Wash.	Carl F. Miller Co.
Tulsa, Okla.	Barada & Page, Inc.
Wichita, Kans.	Barada & Page, Inc.
Mexico D. F., Mexico	N. S. Covacevich
Montreal, Quebec, Canada— (All Provinces)	Canadian Industries, Ltd.

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520 RAILROAD STREET • JOLIET, ILLINOIS

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Brake Shoe Acquires Rochester Foundry

American Brake Shoe Company has contracted to purchase the Progressive Foundry Works Inc., Rochester, N. Y., subject to approval of Progressive's stockholders.

The Rochester plant, a three-story building, with a personnel of 81 employees, has been producing specialty gray iron castings for many years for the glass, machine tool and allied industries. Under Brake Shoe management, the foundry will continue to produce castings for Progressive's old customers in addition to introducing castings made by the process recently developed at Brake Shoe's Metallurgical Research Laboratory.

The new plant will be operated as a new division of American Brake Shoe Co. It will be under the direction of W. T. Kelly Jr., who is also president of Brake Shoe's Kellogg Division. Howard S. Van Billiard, president of Progressive Foundry, will remain as manager. No changes in personnel are contemplated.

William Haislip plans construction of a foundry building at 2006 Mateo Place, Los Angeles, 78 x 84 ft, to cost $15,000.

Here's Longer Wheel Life

AND NEW GRINDING EFFICIENCY FOR YOU

INGENIOUS NEW DEVELOPMENTS END WHEEL BOUNCING AND PERMIT SMOOTHER, BETTER AND FASTER SNAGGING AND CUTTING

GENERAL GRINDING WHEEL
DIAMOND BRAND
GENERAL GRINDING WHEEL CORPORATION'S UNIQUE MANUFACTURING PROCESS RIGIDLY CONTROLS THE SIZE OF THE ARBOR HOLE

VISIT OUR EXHIBIT AT THE FOUNDRY SHOW, BOOTH 513

IN SNAGGING and in other grinding operations, wheel bouncing and vibration not only measurably shortens the life of the wheel but also affects the accuracy of the work. When you "wring" or force a grinding wheel on into place you risk damaging the spindle as well as the wheel thereby causing it to run out of true. Then too certain stresses may be set up which cause the wheel to break. A grinding wheel should fit the spindle snugly or else it will bounce and vibrate causing a hammering action on the work. "General's" unique manufacturing process produces superior snagging and grinding wheels with arbor holes that are accurate to close tolerances. This means longer wheel life and smoother performance. Westaluma cut off wheels are fitted with patented aluminum bushings which protect the spindle from being scored. Even when there is slippage your spindle is protected by the soft bushing. There is a "General" wheel for your every requirement and they assure you: cooler grinding action, longer wheel life and faster stock removal.

CONTACT US FOR COMPLETE INFORMATION

ALUMINOID — CARBONOID

DIAMOND BRAND

WESTALUMA — WESTCARBO

GENERAL GRINDING WHEEL CORPORATION
(West Abrasives, Inc.)
3132 E. THOMPSON STREET
PHILADELPHIA 34, PENNSYLVANIA

Westaluma the only wheel developed especially for the cutting of Gates and Risers

COMMUNITY RELATIONS

(*Continued from page* 157)

friendly and sympathetic relationship between the community and the company.

It is realized that there is no short and easy path to the permanent attainment of good will between a large corporation and the community in which it operates, but a company which is sound internally and one in which management honestly desires the good will and the well-being of the community, may be fairly certain of holding the confidence of the public.

Various specific programs have been adopted by the division, as follows:

Newspapers and radio—Contact is maintained with the newspapers and radio station within the area. News stories of company or company personnel activities, where they are of interest or concern to the community, are supplied, and the division acts as a clearing house for the newspapers when they wish clarification on stories or rumors which reach them. All releases to the press or radio, and all multiple mailings made to those in the community, clear through the division.

We prepared, for use in the local papers, a series of advertisements designed indirectly to get new employees, but aimed primarily at selling three ideas: Caterpillar builds *Good* products, Caterpillar is a *Good* place to work, and Caterpillar is *Good* for this community. These advertisements were first illustrated with photos of our equipment on invasion beaches, building airstrips and doing various other war jobs. Later, as the picture began to change, we began to gently drive home the idea that our products were primarily peacetime machines, that reconversion would only be a matter of changing the color of our paint. This was to indicate that working here was good then, would be good in the postwar future.

Civic groups and organizations—The division encourages the appointment of qualified Caterpillar personnel to serve on civic group committees where the welfare of the community is affected. We have assisted the Community Fund, Association of Commerce, YMCA, YWCA and other similar organizations in their activities, either by serving ourselves or by suggesting willing Caterpillar people for the work.

Booklets we have produced for other purposes but which keep our friends informed of some of our activities, markets, etc., are sent to community leaders listed on the mailing lists maintained. These include such publications as *Caterpillar Magazine*, an external house magazine; *News and Views*, the employees' magazine; the annual report to employees, and the yearly financial report. Community leaders, according to our thinking, are the educators, ministers, professional men and business men, the last named being members of the Association of Commerce. This gives us a substantial mailing list. Recently we added barber shops and beauty parlors, because nearly everyone gets to those places eventually, and they usually have time to do a little reading.

Factory visitors—Local groups of ministers, educators, doctors, lawyers, luncheon clubs, civic groups, local government officials, newspaper and radio station staffs and others are invited to visit the plant for an afternoon and evening. They see the factory, have dinner, and hear a short address or two by company officials.

A more complete program is now being planned whereby prospects and customers, as well as dealers' organizations and their guests, will be taken on guided tours of the factory. Transient visitors,

(*Continued on page* 298)

New Portable Grinder Lasts Longer ...Increases Production

The Portable Gaston Grinder is designed for the grinding and sanding of metal—also, with wire brushes, for paint and rust removal. Because it is powered by a 3-phase motor, without brushes, commutators or gears, the Gaston will give long service.

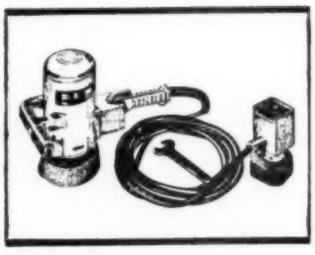
The Gaston Grinder starts at full speed. Its speed remains constant regardless of extra pressure by the operator. This controlled speed under heavy load, eliminates glazing of the grinding wheel; produces a better ground surface.

Three sizes of dust-tight Gaston Grinders are available. Furnished in either "cup-wheel" or "edge-wheel" type, as desired.

In a dusty work atmosphere, that causes throat irritation and dryness, chewing Wrigley's Spearmint Gum helps keep workers' mouths moist and fresh—thereby reducing work interruptions—and "time out" to the drinking fountain.

Workers can stay at their machine, while chewing Wrigley's Spearmint—even when their hands are busy. There is no lost time. And the pleasant chewing helps keep them alert and wide-awake. One Connecticut manufacturer with a dust problem reports group production up about 3% over normal, when workers were given chewing gum. Other plants and factories everywhere, claim stepped-up efficiency when chewing gum is made available to all.

You can get complete information from William H. Howland
2533 East 73rd Street, Chicago 49, Illinois



The Portable Gaston Grinder

AA-68

for more uniformly baked cores

your best bet is a MAEHLER CORE OVEN

...they're proved on the job

FOUNDRIES equipped with Maehler Core and Mold Ovens can reduce core baking time, produce more evenly baked cores, eliminate smoke in the core room and cut operating costs!

One of the big advantages of Maehler ovens is the recirculating air heat principle which assures exceptional heat uniformity (tests show uniformity within 10° F in a fully-loaded oven operating up to 500° F). This kind of temperature control means cores that are uniformly baked with no burning.

Here's what users say about Maehler Core Ovens

The Detroit Brass & Malleable Works reported that with their Maehler Recirculating Air Heat System on a six compartment metal oven they obtain perfect cores—have increased capacity and lowered costs.

After installing a Maehler Air Heat Oven, The Blackmer Pump Co. of Grand Rapids, Mich. reported baking time for small cores reduced 65%—for large cores 30%! ● ● ●

Maehler Core and Mold Ovens are available in a complete range of oil fired, gas fired and electrically-heated units.

· MAEHLER ·

THE PAUL MAEHLER CO., 2200 W. Lake Street, Chicago 12, Ill.

(*Continued from page* 296)

employees and their families and any other individuals or groups from within or outside the community will also be welcome. The Escort Service is being headed up by a man of long "Caterpillar" experience and his staff of escorts will be carefully selected and trained for this most important function.

Requests for donations—The division acts as a clearing house for all requests for donations. Solicitors are courteously received, pertinent facts gathered, material studied and passed on to the proper official for a prompt response.

Speakers bureau—Speakers who can be called upon to talk before local and civic groups, luncheon clubs, and others are enlisted from Caterpillar personnel. They are assisted in gathering material or in the preparation of talks, if they wish. All talks on matters concerning the company clear through Community Relations.

Miscellaneous—We have prepared an attractive portable art exhibit, in which we show the best of the paintings used in our national advertising. With these are reprints of the ads and a brief history of the artist. This traveling salon has been made available to each of the high schools in the community, to Bradley College and to the schools of nearby towns. In addition, the exhibit will go to cities in which our other plants are located. The display has aroused considerable interest and caused much favorable comment for the company.

Along similar lines, we have provided local merchants with a number of window displays, in which our products or our people have been featured.

An important move in improving community relations has been the organizing and support of discussion groups. There is no better known method whereby understanding can be created than through people regularly meeting together and exchanging views. Newspaper space and radio time can be bought and filled, often to little avail. Those who read or hear it are usually those who are concerned with the activity, and who already approve. They like to see or hear their belief confirmed.

For three years the Peoria clergy of all denominations and local business leaders have been meeting once a month for dinner and discussions. Joint committees prepare programs of mutual interest to both groups. No subjects are barred. A speaker from each group gives a ten-minute talk or paper on a pre-arranged subject, and an hour of discussion follows. The group is not an action group at all. They are gathered together for one purpose only and that is to get better acquainted with one another.

Groups Meet for Discussion

More recently representatives of organized labor were invited to become a part of the group and their response has added materially to the effectiveness of the meetings.

In the same manner, educators and businessmen come together in a similar way and for similar reasons. They too have been joined by representatives of labor and their discussion meetings are conducted along the same lines as those of the first-mentioned group. There are no long speeches—just two ten-minute talks by representatives of two of the three groups—and the meeting is thrown open for discussion. Subjects like "Improving Standards of Living," "Causes of Unemployment," "Postwar Education," "Social Security," "The Profit Motive" and many others have been put on the docket for exploration.

The sizes of the groups are kept down to fifty or sixty people—originally decided as being best for good general discussions. The spread of influence of those meetings is quite noticeable throughout the community.

(*Concluded on page* 300)

MADE OF ASBESTOS
They can't corrode!
Transite Core Plates have all these important advantages:
Light Weight—Easier to handle, permits heavier loads.
Less Breakage—Fibrous asbestos-cement structure resists shocks, minimizes cracking and breaking.
Easily Cleaned—Both sides usable. In the oven, core washes burn off the underside.
Economical—Low price, low upkeep, long life . . . cost less in the long run.
Low Warpage—less than 0.1%.
Corrosion Resistant—because of asbestos-cement composition.
Perforated Plates—also available, to eliminate green cores and reduce baking time.
JM
Johns-Manville
TRANSITE CORE PLATES
22 E. 40th St., New York 16, N. Y.

"A NORTHERN HI-LIFT HOIST up there Would Slash Handling Costs"

An efficient Northern Hi-Lift . . . low-headroom Electric hoist saves in many ways:

1. labor saving

When men lift and move material by hand, the power generated costs you at least $5 per kilowatt hour. Power for a Hi-Lift Electric Hoist costs you less than a nickel per kilowatt hour. Manpower lifting is slow, time wasting, costly. Hi-Lift Hoists do it quickly, economically.

2. time and overhead saving

Inefficient, slow material handling causes delay and countless minutes of lost time all through the shop while other operations wait on handling. Hi-Lift Hoist saves this time and money.

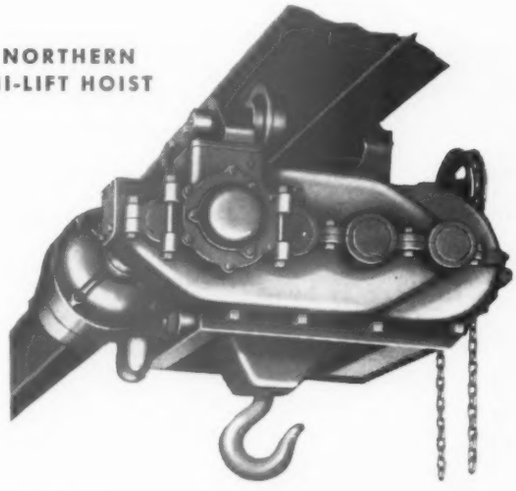
3. saving through safety

Men handling heavy material by hand are subject to serious and costly injuries. Power handling avoids these.

4. saving in floor space and overhead

Northern Hi-Lift Hoists use *no* floor space—carry the material above the floor. There is no vehicle wear on the floor—no danger to workers from rapidly moving vehicles. Aisles are used for work and walk space only—a substantial saving in space. The low-head-room feature of Hi-Lift Hoists makes better use of overhead space—permits handling of bulkier loads.

NORTHERN HI-LIFT HOIST



Northern Hi-Lift Electric Hoists are extremely sturdy, long lasting. Write for Bulletin H-1.

1542

NORTHERN ENGINEERING WORKS

TYPES OF NORTHERN HI-LIFT HOISTS AVAILABLE

Floor controlled hoists • *Motor traveled hoists*
Cab controlled hoists • *Base mounted hoists*

(*Concluded from page* 298)

It should be a matter of first concern to state and national business men to make the first move in creating such groups—should make the number-one job for the business man the obligation of attending and taking part in these important meetings.

There is a great deal more at stake than most people realize. It is entirely possible that should misunderstanding continue much longer, the majority of our citizens might favor the discontinuance of private ownership and handling of business, preferring that it be placed in the hands of government. When that is done, men eventually will be told where they will work, what they will do, what they will be paid, what their hopes may be for the future, what they may or must buy. They will be living under a centrally-controlled form of government.

As consumers, we will then have only those things which someone decides are good for us, someone else decides what may be produced and someone else produces when he gets to it. Then we will trust to an all-wise central distributing agency to get it to the right place on time. Remember the bread slicing orders. First, we do, then we don't, then we do again!

It all boils down to this. "Shall individuals plan for themselves with government operating to insure fair play, or shall the government make all plans and act for everyone?" Once we decide on the latter course, we will find ourselves unable to reverse our decision. There will be no turning back. And there will be hundreds, thousands and millions asking themselves, "Why didn't we see this coming 'back in 1945'? Why didn't we do something about it then?" And who will be asking those questions? America's men and women—not just the employers, but also working men; not those now considered rich, but those now considered poor by our standards; everyone will *silently* ask himself—why? To speak out loud will bring swift punishment.

It is only through meeting face to face and exchanging views with others that typical Americans can really understand how goods are produced and distributed, how funds are secured, how the whole economic system of this great free country works. Most of all, it is to the advantage of everyone—not just a few—that we continue under a system which *made* this country—where more people have more things than any others in the world. Let's *all* get busy improving the system we have; we do not destroy a house simply because the roof leaks.

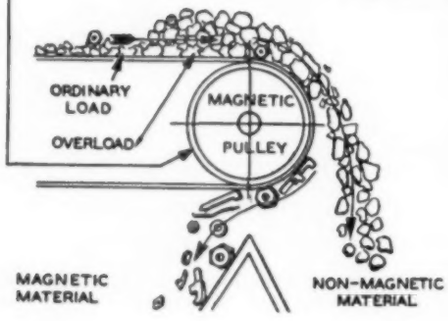
There is one more great advantage to a program of "getting acquainted again." It is this. It is a pleasant thing to like people. It is good to know and trust those around you. There is so much satisfaction in just plain friendliness that once we all get accustomed to it again, we will be a country that is hard to split.

While this job cannot be done unless there is a sincere co-operation between the teacher, the clergyman, the farmer, the doctor, the homemaker, the employee and the employer, it is yet up to the men managing the free business enterprise of this area to take the lead. They owe it to their fellow Americans to take on this job in their own immediate areas. It can be done *nowhere* else. It can be done by *no* others. But it *can* be done!

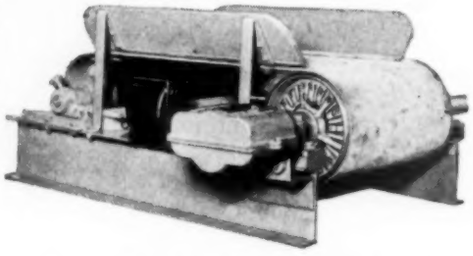
RECLAIM METAL FROM SAND

with

STEARNS MAGNETIC PULLEYS and PULLEY Separators



For efficient, automatic and economical aid in sand conditioning and reclamation of metals, Stearns Magnetic Pulleys (Air-cooled for more power) are producing definitely profitable results in foundry installations everywhere. Your best low expense, effective and automatic insurance against the tramp iron nuisance. In all sizes to serve as head pulleys in your conveying system.



Completely self-contained Magnetic Pulley type Separator with belt tail pulley, frame—or with two magnetic pulleys, depending upon your capacity and separation desired.

STEARNS MAGNETIC MANUFACTURING CO.

MAGNETS • CLUTCHES • BRAKES

662 So. 28 St. MILWAUKEE 4, WIS.

Buys Furnace, Oven Manufacturer

Foundry Equipment Co., 1831 Columbus Rd., N. W., Cleveland 13, O., has purchased the McCann Furnace Co., Cleveland, including corporate name, trade name, patents and drawings, and will continue the manufacture and sale of the McCann furnace and oven equipment. All activities will be combined at the main offices of the Foundry Equipment Co., Cleveland.

If You Need it "PENNSY" has it and is ready to ship, service and advise...

Under the impetus of the war the Foundry Industry probably grew twenty years in four years. This was not only true of materials and equipment, but service as well.

Only a few years back a foundry supply house was more or less a warehousing outfit. They had it when you wanted it. Today, there is a whole new conception of the business, at least speaking for ourselves.

There is a greater emphasis on getting closer to the man who has to make a profit from the things he buys from us. Out of this newer sense of responsibility has come . .

BROADER STOCKS AND LINES . . you can fill more of your needs with one inquiry or one order from one supplier.

EQUIPMENT AND PARTS . . it is easy to get greater production from labor today if you give the tools that make greater production a pleasure.

BETTER FOLLOW THROUGH . . if you need it, we will comb the markets of the world to find it.

ENGINEERING COUNSEL . . investments in equipment running into large sums is hardly justified without the complete facts. We will provide them or we don't expect the equipment order.

SERVICE . . an honest effort on the part of practical men to help you get the most out of "buys."

Equipment & Products by—

BEARDSLEY & PIPER CO.
Sand Slingers—Speedmullors, Sand Conditioners, etc.

STROMAN FURNACE & ENGINEERING CO.
Melting Furnaces

DELTA OIL PRODUCTS CO.
Delta Products for the Core Room including:
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INDUSTRIAL EQUIPMENT CO.
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F. E. SCHUNDLER CO.
Bentonite Akro

BLACK, CIVALLS & BRYSON, Inc.
Steel Flasks of every possible specification.

And Varied Essentials like:

"ONE PIECE" CHAPLETS, Stem and Double Heads . . chaplets of all kinds . . "PENCO" Ceres Cereal Binder . . BUCKEYE Silica Firestone . . CORE BLOWERS . . SEA COAL FACING . . SILVER LEAD Facing . . CORE SAND MIXERS . . PURITE . . STOCK CORE MACHINES . . SNAP FLASKS . . SLIP FLASKS . . JACKETS . . Bands . . Bottom Boards . . Core Plates . . Pneumatic & Electric Vibrators . . Crucibles . . Blacking . . Skim Gates . . Shovels . . Pitch Compound . . AKRO CORE COMPOUND . . PERMABOND . . BONDITE . . CHILLKOAT . . Plastic Iron . . Hand Riddles . . Electric Riddles . . Molding Machines . . Roll-over, Jolt squeeze and push-off machines . . Steel Shot and Grit . . . Refractories.

We will be looking for YOU at

The CLEVELAND CONVENTION

PENNSYLVANIA FOUNDRY SUPPLY & SAND CO.

ASHLAND & E. LEWIS STS., PHILADELPHIA 24, PA., Tel. JEF. 1012

WHO DISCOVERED BLACK HEART MALLEABLE?

(*Continued from page* 175)

This was in June, 1871. These men went out far in advance of other pioneers, so much so that they had no neighbors, even to the south and east, for three or four years, within 30 miles.

"About a mile north of the finding place another medieval Norse implement was found the same summer. This was a small fire-steel. The finder was engaged in making post holes with a big augur. On getting down about 2 ft, he thought he struck stone and pulled up the augur. Its spiral groove brought up the soil in consecutive layers, and at the bottom he found he had reached a layer of charcoal and ashes, and among it was the fire-steel. It must have taken centuries for the winds to cover that ancient fireplace, 2 ft deep with dust from an unplowed prairie. In 1928 I had the fire-steel with me on a trip to Europe, and the director of the University Museum identified it as a Norse fire-steel from the Viking Age.

"The other halberd, which Prof. Ragatz sampled, was found on the shore of Lake Darling, 2½ miles north of Alexandria, Minn."

Two of these halberds were sent to Prof. R. A. Ragatz of the University of Wisconsin for examination. The latter recognized that the bodies of these halberds, to be described in more detail later, were of black heart malleable, and very kindly sent his metallographic specimens to the author's laboratory for confirmation. They were found to be completely graphitized malleable iron; the nodules were somewhat more rounded than in contemporary material, and decarburization was found to only a very limited extent.

There seem to be the following possible sources of the articles:

The objects are of Norse origin, in which case black heart malleable existed in Scandinavia in 1346.

The objects were relics of the French explorations, in which case black heart malleable existed in the 17th century.

The objects are of Norse origin but were white cast iron and an interval of 600 years was sufficient to permit spontaneous graphitization.

The objects are of relatively recent American origin and their discovery is both uninteresting and unimportant.

Analyzes the Facts

In favor of the first possibility is the apparent certainty that Norsemen were in this territory in the 14th century. The overall design is typically Norse.

Against it is the fact that no black heart malleable dating from that period had previously been discovered. We must thus later examine the possibility that the product did nevertheless exist and that this is the first report.

Also militating against either a Norse or a French origin is the fact that a portion of the halberd staff is still in the halberd and apparently in good condition. It has not become mineralized sufficiently to make it in any degree opaque to x-rays.

Nothing in particular favors a French origin except that white heart malleable no doubt was occasionally made in the 17th century. Apparently no other finds of French origin have been made and Holand feels that any early origin of the halberds implies association with the Knutson expedition.

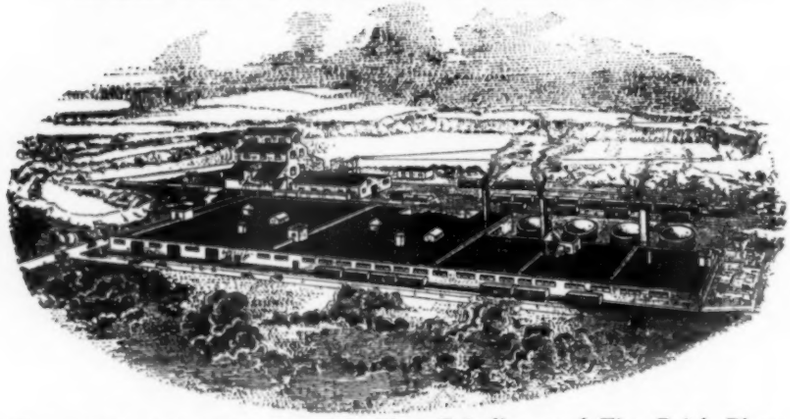
The existence of some decarburization plus the danger of cracking in riveting white iron precludes the slow graphitization at low temperature theory.

The major objection to the recent theory is that one of the halberds was found so soon after white men entered this

(*Continued on page* 304)

GOOSE LAKE

Fire Clay and
Fire Clay Flour
Fire Clay Brick
Therm-O-Flake Insulation



Goose Lake Clay Deposit with Clay Grinding and Fire Brick Plant

Illinois Clay Products Company

JOLIET, ILL.

● The trend is strong toward use of carbon for blast furnace linings. Why? Just consider the valuable advantages of this basically different kind of lining material—

1 Lasts indefinitely!

A properly-installed carbon block lining in a blast furnace should last indefinitely. This results from the remarkable physical properties of carbon: no melting point, low thermal expansion, highly resistant to thermal shock, not wet by molten metals, immune to metal and slag attack, mechanical strength maintained at high temperatures.

2 No Salamander!

Years of experience with carbon linings bears this out. Consider what a saving this feature, alone, can mean to you.

3 Fast, easy to install!

One carbon block can take the place of from 50 to 1000 nine-inch firebrick, depending upon the size of the block. Overall installation time is thus greatly reduced.

Interior of hearth lining looking toward iron notch. Blocks may be of any size desired up to 24x30x180 in.

4 Economical in long run!

Operating experience is proving that carbon linings are definitely more economical in the long run . . . as is evident from the features outlined at left.

Get more details:

Engineers at National Carbon Company, Inc., will be glad to supply you with full available information on all phases of installing a carbon lining. Write today **to Dept. FY.**

WHATEVER YOUR PROBLEM — CONSIDER CARBON OR GRAPHITE

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation
The word "National" is a registered trade-mark of National Carbon Company, Inc.

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surveys
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Alnor PYROCON

the contact pyrometer for quick accurate surface temperatures

This convenient all-purpose surface temperature pyrometer is ideally suited to a variety of foundry and general industrial plant needs.

Accurate temperature readings are obtained in a few seconds, of liquids, oils, and flat or curved, stationary or moving surfaces. The rugged, shock-resisting Pyrocon movement is used with any one of eleven types of thermocouples, interchangeable without adjustment or re-calibration. Choice of rigid or flexible arms, or both, instantly interchangeable. Built in several ranges, 0-300 deg. F. to 0-2000 deg. F. Write for bulletin giving complete description.

ILLINOIS TESTING LABORATORIES, INC.

418 North La Salle Street · Chicago 10, Illinois

(*Continued from page* 302)

region and that, according to Holand, various authorities, including Quaife, who has apparently not been very sympathetic to some of the evidences of Norse migration, have been definite in stating that the halberds are not American-made Indian "trade goods."

Abandoning other suggestions, one may consider the possibility of medieval Scandinavian origin.

The halberd found in the stream is shown in the accompanying illustration. It consists of two halves, right and left handed, riveted together with a steel blade between. It is not well suited to use as a weapon or a tool. The staff is only about ¾-in. in diameter and hence far too weak for effective striking. The blade, being much thinner than the body into which it is inserted, would not penetrate very deeply if used with a chopping motion. The blade, though low in carbon, was very brittle—probably due to hammer hardening—and had become chipped badly as shown. What little remains of the cutting edge suggests a semicircular form.

Proof Seems to be Lacking

Holand feels the halberd may have been merely a ceremonial weapon, and not for practical use. While it seems foolish for a small and isolated expedition to burden itself with objects of ceremony or symbols of authority, it must be remembered that Nicolet, some three centuries later, carried an embroidered damask robe to impress the Chinese, whose territories he expected to reach via the Great Lakes. Also the lack of utility may account for the loss of the halberds when the expedition was hard pressed.

As to design, the authorities seem to differ:

Holand informs the writer that Dr. Sigurd Grieg, director of the university museum at Oslo, believes that photographs of the halberds "undoubtedly show two halberds from about 1500." This taken without modification precludes their having been left in Minnesota 150 years sooner in 1350. Carl Benedicks kindly consulted the Swedish authorities for this writer and was informed that no halberds composed of three parts, as are the present, occur in the Stockholm collections. Halberds for ceremonial use, with screwed shafts, were introduced in 1654. Why would anyone make so weak a structure? Possibly because the art of coring holes was not known. The socket of an ancient Norse spear in Holand's collection shows evidence of having been made by forming two halves and welding.

Whether new or old, why would a

(*Concluded on page* 306)

SCHNEIBLE SYSTEM PROVIDES COMPLETE FREEDOM FROM DUST AT LAKE CITY MALLEABLE!

Modern day working conditions prevail in the vast Ashtabula, Ohio, foundry of Lake City Malleable Co., the main building of which is 240' x 790'.

Workers breathe clean air throughout this foundry. Dust-creating operations are completely controlled by a Schneible Multi-Wash System, including Uni-Flo Hoods for the shake-outs, with a total collector capacity of approximately 125,000 c.p.m.

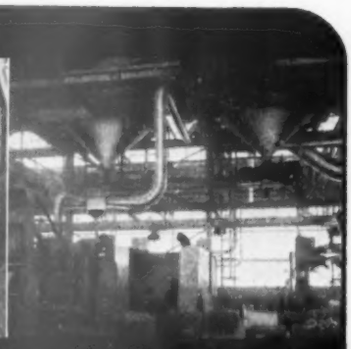
Foul air is carried by exhaust piping to Schneible Multi-Wash Dust Collectors. Here all contamination is continuously removed from the air. The collected matter, as sludge, gravitates to a Schneible Dewatering Tank, where the water is separated for repeated use in the collector system. The dewatered sludge is piped to a ravine on the property. A Schneible "Wear-Proof" Pump recirculates the water, and another removes the sludge.

A Schneible Multi-Wash System such as this not only solves the dust problem permanently, but is economical in the long run. It functions indefinitely with but little attendance, and is correctly built to require a very minimum of maintenance.

CLAUDE B. SCHNEIBLE CO.
2827 Twenty-Fifth St.
Detroit 16, Mich.

Engineering Representatives in Principal Cities

Mold Dump-Off Stations and Cooling Conveyors with Schneible Cooling Hoods.

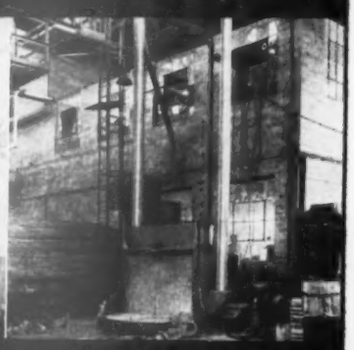


Tumblasts and shot blast equipment, with two 30,000 c.f.m. collectors.

Abrasive Blast Cleaning room served by two large Multi-Wash Collectors overhead.

Unusually clean cleaning room, with Velocitraps under floor of grinding stands.

Skimmer Tank with recirculating pump. Periodically pumped-out to disposal field.



Hard Iron Shot Blast Table—an isolated operation—with its own collector overhead.

Weight and Jacket Shifting ventilated with Schneible Uni-Flo Hoods.

Two of the Multi-Wash collectors protrude through the roof.

SCHNEIBLE

LIQUID-VAPOR INTIMATE CONTACT EQUIPMENT for DUST COLLECTION ABSORPTION CONDENSATION AND TEMPERATURE REDUCTION

PRODUCTION • MECHANIZATION • OPERATIONS • MANAGEMENT

Consulting and Engineering Service

From the Design of the Foundry to the Shipment of the Finished Castings

A Complete Cost Production and Profit Analysis.

- Plant Design and Layout
- Modernization
- Mechanization
- Centrifugal Castings
- Metallurgical Control and Standardization
- Methods for Increasing Production and Reducing Costs
- Foundry Management Counsellors

STANDARDS—INCENTIVES—METHODS—EVALUATION.

W. G. REICHERT ENGINEERING CO.

1060 Broad St., (Industrial Bldg.) • Newark (2) New Jersey

DOUGHERTY
PERFECTION
PATTERN LUMBER
Is The Best Any Shop Can Use!
WHITE PINE
MAHOGANY
PLYWOOD

Hardboard for templates and lagging, dowels and bottom boards . . . skids and crating for large castings or machinery.

I've seen a lot of lumber come into our pattern shop and for resistance to warping, checking or hardening . . . Dougherty Perfection Pattern Lumber tops them all!

• • •

Sawn from choice old growth logs. Kiln dried in our own plant. And even in these days of critical shortages, this is one pattern lumber that is keeping its reputation for quality.

UNION WHOLESALE
YOUNGSTOWN 8, OHIO
Phone: 4-5189

DOUGHERTY
CLEVELAND 5, OHIO
Phone: Diamond 1200

KEYSTONE
PITTSBURGH 3, PA.
Phone: HEmlock 0700

LUMBER COMPANY

(*Concluded from page* 304)

steel blade be inserted in a mere ornamental object?

Attempts to decide, on the basis of microstructure, whether the steel insert is ancient were made with the kind cooperation of Harry Craig Richardson, then of Republic Steel Co. They were somewhat inconclusive but it may be significant that no slag inclusions were observed, which are common in ancient irons.

As to metallurgical possibilities, cast iron was made in the Rhine Valley at about this period. Benedicks informed the author that T. Althin, chief of the Technical Museum in Stockholm, says that the production of pig iron in Sweden goes back to about 1200 A. D. That white cast iron may have been produced is most likely. That any metallurgist of the period had skill to maintain an effective annealing cycle seems doubtful since long times at accurately controlled temperatures are essential. He was not getting an accidental result, for four separate pieces have been studied, nor was he likely to be trying to decarburize, for the rims are very inconspicuous. The form of carbon nodule speaks for a low annealing temperature, which might be all an early workman could reach.

We concluded as we began, "How Old Is Malleable Iron?" If this piece is really almost 600 years old, consider its rust resistance!

Appoints Midwestern Representatives

General Grinding Wheel Corp., Philadelphia has appointed A. R. Soltis regional manager for the Midwest territory, in the sale of its resinoid bonded abrasives. A. R. Soltis Co. has been appointed exclusive representative in that territory for the sale of vitrified and rubber bonded abrasive products for the company. Mr. Soltis was formerly Detroit and Indianapolis representative for the abrasive division of U. S. Rubber Co. The new General sales office and warehouse is located at 1627 West Fort St., Detroit.

New Alloy Described By Film

Frontier Bronze Corp., Niagara Falls, N. Y., has released a sound motion picture entitled "This Is Frontier 40-E," which is being distributed through the company's advertising and sales departments. The half-hour film is a technical treatise concerning Frontier's new high-strength aluminum alloy, and describes the production and utilization of the metal.

Scrap your old crucible furnace now *at a Profit*

Here is a "revolutionary" TOP fired crucible melting furnace... it's different... it's new... and it's better. This Radiant Combustion, Inc. furnace has two crucibles, loaded at all times... they are fired alternately. While the first crucible is heated, the flue gases from it preheat the second crucible. While metal from the first crucible is being poured, a third crucible replaces the removed crucible to receive cold metal. The covers are cam lifted and swung backward independent of one another, allowing each side to be alternately fired. The advantages are so outstanding that no one can afford to use the older type. Refer to column on right-hand side ... *write today.*

18 REASONS

1 25 to 30% fuel saved on aluminum and magnesium. 40 to 50% fuel saved on brass and copper.

2 50 to 100% longer pot life.

3 50 to 100% longer lining life.

4 50 to 100% longer cover life.

5 50 to 100% longer burner life.

6 Easy to charge. (No flame through cover)

7 Far lower metal loss. (Flame does not impinge on metal)

8 Faster heating. (Combined radiant and convection heating)

9 Less slagging. (Less slagging and no slag build up possible)

10 Lining is easy to replace. (No burner ports)

11 Burners easy to inspect and replace. (Change in 15 minutes)

12 Burners cannot plug. (Burners in top where slag or metal cannot reach them)

13 Pure metal. (Neutral pressure on metal surface allows charcoal or atmosphere to be used)

14 Furnace can be flued through the floor to the outside, eliminating heat and gases in foundry.

15 No leakage of cover. (No flame through or around cover)

16 Quiet operation.

17 Unobstructed flueing. (Flued at bottom and charge does not affect it)

18 Metal is visible at all times and temperature can be taken at any time, without shutting off burners.

RADIANT COMBUSTION, INC.

BUILDERS OF EVERY TYPE (OIL, GAS, ELECTRIC) OF HEAT TREATING FURNACE

WARREN, I . . . OHIO

New EQUIPMENT and SUPPLIES

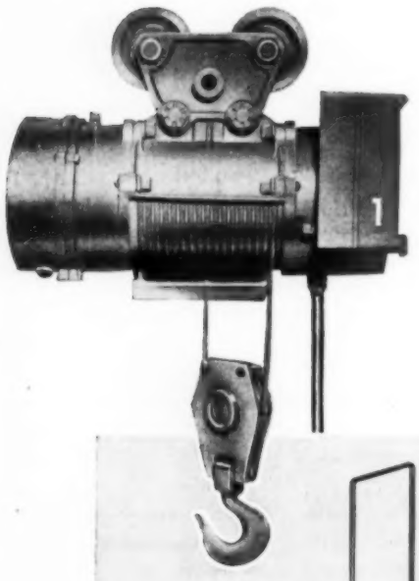
(1)—Cable Hoist: Lisbon Hoist & Crane Co., Division of the Wright File Co., Lisbon, O., is introducing a new electric cable hoist of unusually light weight, made in practically three sections to permit complete and easy access to any part by removal of about four bolts. Motor is entirely enclosed in drum, with proper heat dissipation construction. Ball bearings are used throughout. Gears are all heat treated alloy steel. The hoist has a safety factor of six to one and better.

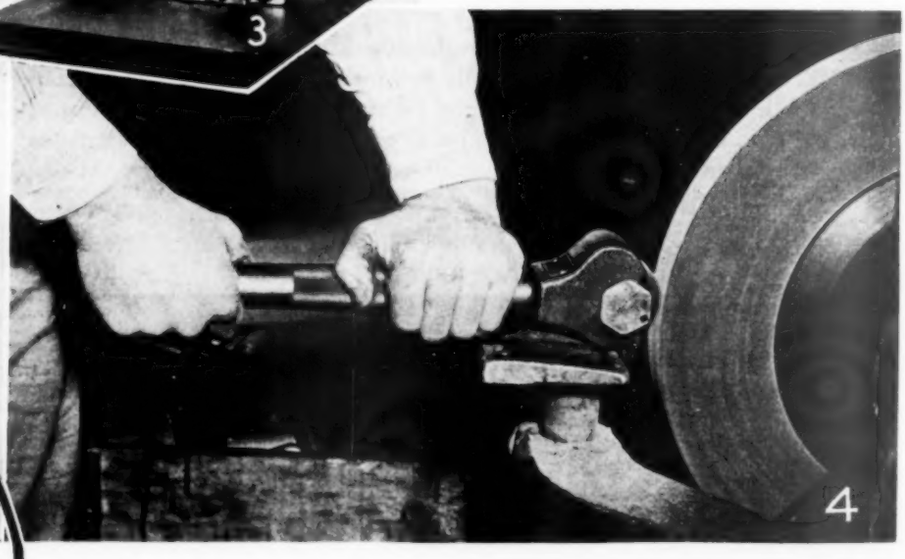
(2)—Carbon Determinator: Lindberg Engineering Co., 2453 West Hubbard St., Chicago 12, has developed a volumetric type carbon determinator which is easily and quickly adapted for use with any high temperature combustion tube furnace. A precisely graduated burette mounted in front of a fluorescent light for easy reading, makes for an accuracy of one point of carbon, or better, and eliminates eye fatigue. Burette is water jacketed and graduated for 1-g and ¼-g samples, permitting full range use in analyzing carbon in iron, steel, heat resisting and stainless steel, and other materials. Absorption chamber permits complete absorption in two passes; for many alloys one pass is sufficient. Chamber combines the use of glass tubing and glass beads, for gas dispersion.

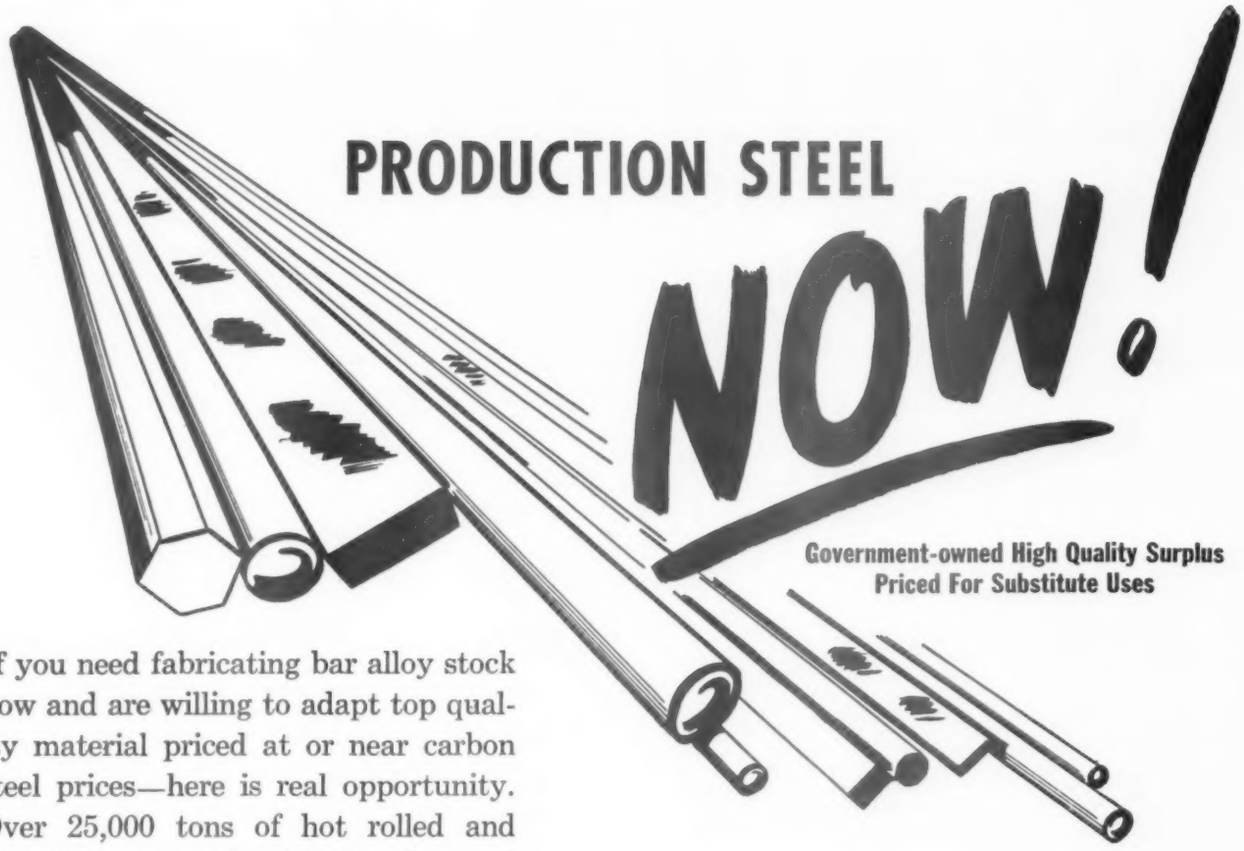
(3)—Core Blower: Redford Iron & Equipment Co., 21315 West McNicholls Rd., Detroit 19, is offering an improved cartridge bench core blower which requires a minimum of maintenance, the only wearing part being the rubber cartridge sealing disk, which can be replaced quickly. Arm casting in which blowing cylinder is mounted has been made more sturdy, and bronze sleeve bearings have been inserted for wear around blowing cylinder. Column that supports arm and blowing cylinder is utilized as an air reservoir which trebles air capacity per operation. Air blow gun at base of column insures dry air for blowing cores. Air pressure gage is installed near top of column reservoir so that line pressure is visible at all times. Valve operating handle is of cast brass to fit palm of operator's hand. Cartridge sealing rubber now is of abrasive-resisting rubber. Corebox clamping attachment can be furnished for use in blowing vertically split coreboxes, and corebox drawing attachment with vibrator and knee valve can be furnished for difficult cores.

(4)—Wheel Dresser: G. J. Wallen Mfg. Co., 617 Bryant St., San Francisco 7, announces a new grinding wheel dresser with special forced-feed

(*Continued on page* 310)







PRODUCTION STEEL NOW!

Government-owned High Quality Surplus Priced For Substitute Uses

If you need fabricating bar alloy stock now and are willing to adapt top quality material priced at or near carbon steel prices—here is real opportunity. Over 25,000 tons of hot rolled and 25,000 tons of cold finished carbon and alloy steel bars are ready for immediate shipment to you. The stock is available in standard sizes, shapes, but is of above average grades. Accordingly it has been priced at levels such as to insure its quick employment to meet America's postwar needs. For details on F.O.B. locations, sizes, quantities and shipping arrangements contact your nearest W. A. A. Regional Office below . . . or clip and mail this coupon.

VETERANS OF WORLD WAR II: To help you in purchasing surplus property from W. A. A. a veterans' unit has been established in each of our Regional Offices.

FREE INFORMATION

To War Assets Administration:

Please send me information on the availability and pricing of the following:

- Carbon and Alloy Billets, Blooms, Slabs, Rods, etc. ☐
- H. R. & C. F. Alloy Sheets, Strips and Plates ☐
- Stainless Steel Sheets, Strips, Standard Types ☐
- Valves and Fittings ☐
- Mechanical Tubing, Carbon and Alloy ☐

NAME..... TEL. NO.....

FIRM.....

ADDRESS.....

CITY..... STATE.....

157-5

WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

ALUMINUM
CASTING METAL
for Sand, Permanent Mold Die Casting

TRADE **LECTRO-PAT** MARK

the Aluminum Alloy Made Especially for
PATTERNS, PLATES and MATCH PLATES

THE CLEVELAND ELECTRO METALS CO.
CLEVELAND 13, OHIO
MEMBER—ALUMINUM RESEARCH INSTITUTE

50 Years of Better Melting

WE CONGRATULATE the A.F.A. on its Golden Jubilee, marking 50 years of service to the foundry industry. For the past 50 years, too, we have been producing by-product foundry coke. Here is what one central New York State foundry said about Semet-Solvay Foundry Coke in 1898— *"We are pleased to say it has given us splendid satisfaction. Melts fast and hot and does not make hard iron."* Today this foundry is still receiving from us shipments of "splendid satisfaction" just as then.

SEMET-SOLVAY COMPANY

BUHL BUILDING, Detroit 26, Mich.
GENESEE BUILDING, Buffalo 2, N. Y.
DIXIE TERMINAL BUILDING, Cincinnati 2, Ohio
Canadian Sales Agent: Standard Fuels Co., Ltd., Toronto

Semet-Solvay Foundry Coke

for Better Melting

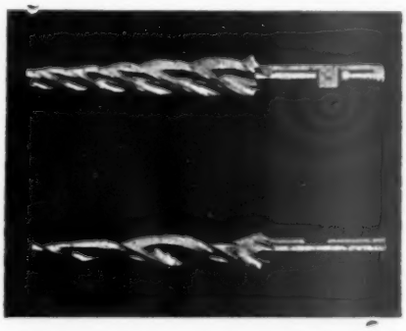
(*Continued from page* 308)

lubrication which protects bearings from grit and saves cutter cost and replacement. Pressure-fed grease seals bearings and cutters, preventing grit from feeding back into the dresser. Bearings and bosses are made of steel, hardened to outlast many hundred sets of cutters. One of the bosses is adjustable to take up any side play in cutters. Grease that accumulates within head of the dresser catches dust or fine grit and prevents it from being inhaled by operator. Two sizes are available. No. 1 is for use on wheels up to 12 in. diam and 2 in. face. No. 2 dresses wheels up to 60-80 grit and of diameters down to 3 in.

Flow Regulator: Waterman Engineering Co., 721 Custer Ave., Evanston, Ill., announces a hydraulic flow

regulator, available in all pipe sizes for users of hydraulic machinery. By use of the device machine tools and lift devices can be controlled to predetermined speeds and insured against sudden release of hydraulic pressure. It requires a space only a fraction larger than the line in which the unit is used.

Milling Cutters: The P.M.S. Co., 1071 Power Ave., Cleveland 14, has developed a series of tapered milling cutters intended especially for pattern shop use. Made of high-speed tool

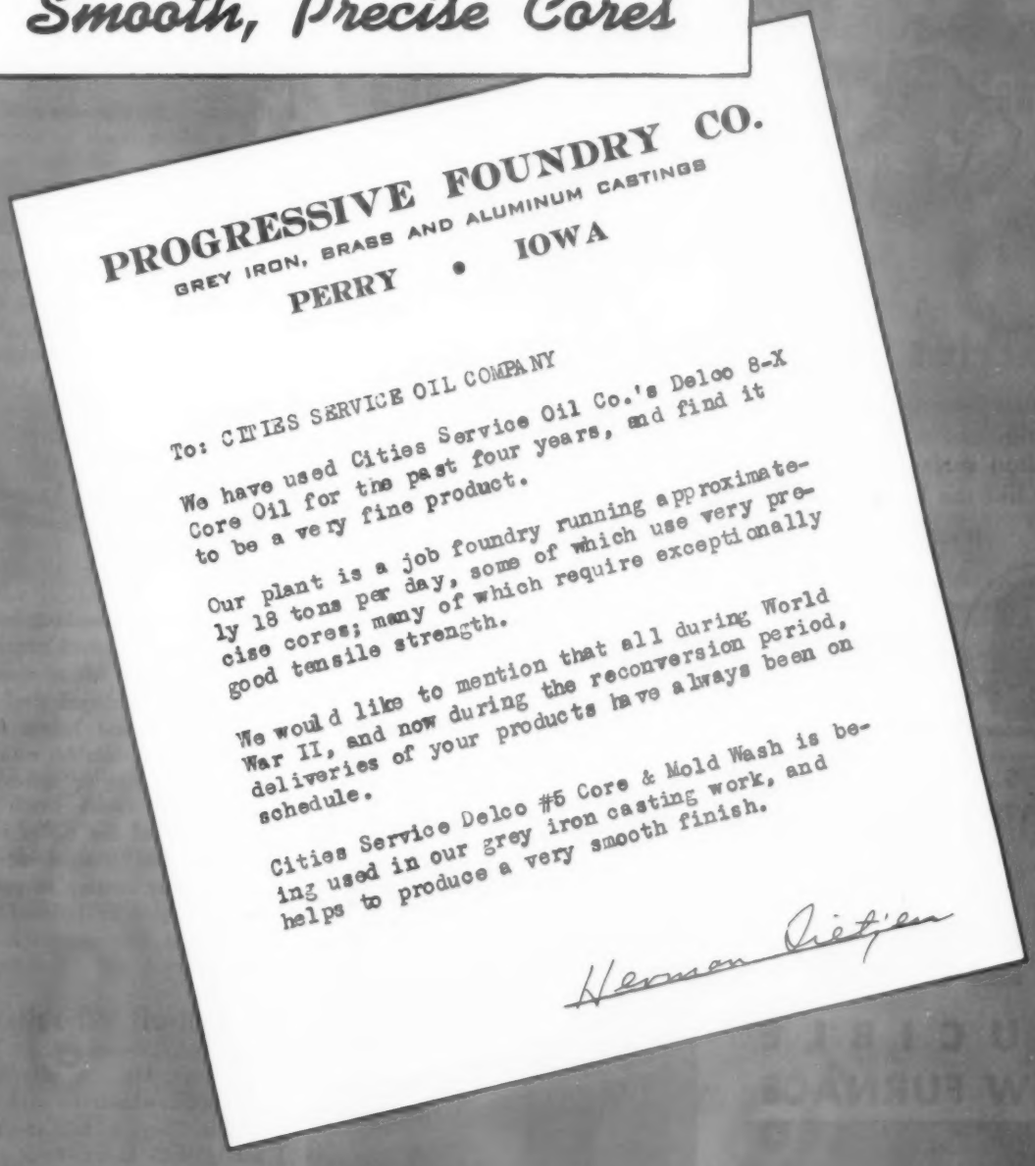


steel, the tool's helical cutting edge is designed for machining aluminum, brass or steel. The cutters are available in lengths of 2, 3, 4 or 6 in. and with tapers of ½, 1, 2, 3, or 5 degrees. Time-saving economy is claimed for their use in patternmaking.

Timer: Photoswitch Inc., 77 Broadway, Cambridge 42, Mass., announces a repeat cycle timer designed

(*Continued on page* 312)

Smooth, Precise Cores



PROGRESSIVE FOUNDRY CO.
GREY IRON, BRASS AND ALUMINUM CASTINGS
PERRY • IOWA

To: CITIES SERVICE OIL COMPANY

We have used Cities Service Oil Co.'s Delco 8-X Core Oil for the past four years, and find it to be a very fine product.

Our plant is a job foundry running approximately 18 tons per day, some of which use very precise cores; many of which require exceptionally good tensile strength.

We would like to mention that all during World War II, and now during the reconversion period, deliveries of your products have always been on schedule.

Cities Service Delco #6 Core & Mold Wash is being used in our grey iron casting work, and helps to produce a very smooth finish.

Herman Dietjen

CITIES SERVICE

Our policy is to maintain the highest standard of quality in the manufacture of Cities Service Delco Core Oil, and not to substitute inferior ingredients to secure lower cost. Our engineering staff is always at your service.

CITIES SERVICE OIL CO.

☆little but- Oh My!

Carries its weight

in your Foundry where there's work to do. Save those castings with Shelton surface patching cement—sets like the Rock of Gibraltar.

Write for free sample

SHELTON METALLIC FILLER

AMERICAN CRUCIBLE COMPANY

SHELTON, CONN.

PRODUCTION UP---COSTS DOWN

WITH THE

ILER

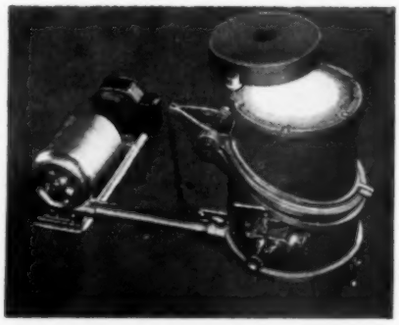
CRUCIBLE DRAW FURNACE

The ILER Crucible Draw Furnace insures faster non-ferrous production at lower cost because its exclusive Split-Body saves time in removing and replacing crucibles. No tongs necessary. No overhead handling equipment. Pour direct from crucible. No overheating of metal and no ladle or

SEE OUR EXHIBIT BOOTH 430-A

FEN MACHINE CO.

1350 Babbit Road, Cleveland, O.



← NOTE EXCLUSIVE SPLIT BODY DESIGN

extra crucibles needed.

When open, the heat is trapped in upper section of furnace saving fuel and cutting reheating time. An automatic air lift opens and closes the furnace at the touch of a valve.

No pit is required, furnace is mounted on legs, rests on the floor.

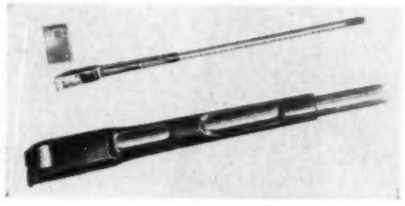
Available in sizes 50-70-90-125 to accommodate crucibles of corresponding numbers. Gas or oil burner optional. Check on ILER savings and advantages for your own non-ferrous department now.

ILER CRUCIBLE DRAW FURNACES

(*Continued from page* 310)

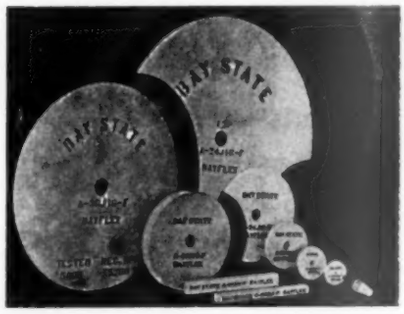
for machinery and process control and recommended for applications requiring two adjustable timing periods to run in a continuous cycle. This cycle is initiated by either monetary or sustained contacts, and provision for automatic recycling is provided. Each timing period is adjustable from 1/20 of a second to 2 minutes. Control is accomplished through specially designed snap-action relays which result in extreme accuracy and interchangeability. Interval variations in repeat cycle timing are less than 2 per cent.

Lifting Bar: Arnolt Motor Co., Warsaw, Ind., is offering a new lifting bar which is especially recommended for use in relocating machinery in plants,



for moving or wrecking buildings or for lifting heavy objects onto dollies. The bar, which can lift as much as a 5-ton load, has a hardened steel roller for extra leverage and ledges for safe gripping. It is available with notched toe plates for prying up spikes and lag bolts and getting under heads and corners; straight-edged toe plates for lifting and moving; and straight-edged toe plates with rubber coating to prevent scratching enameled or finished surfaces. Toe plates are interchangeable. The bar is offered in 1 and 5-ton capacities.

Cut-off Wheels: Bay State Abrasive Products Co., 7 Union St., Westboro, Mass., is offering a new line of cut-off wheels for use on nonferrous metals. They are said to combine greater safety with faster, freer cutting action,



and minimum wheel breakage, and to provide increased toughness and balanced flexibility through use of a new bonding material. Flexibility permits side grinding and close following of contours.

Wash Fountains: Bradley Washfountain Co., 2217 West Michigan St., Milwaukee 1, again is offering its fountains in enameled iron and stain-

less steel. Discontinued during the war, the new units have been completely redesigned and streamlined. The enameled bowls are pressed in one piece from high quality steel and finished in white acid-resisting vitreous enamel. Stainless steel bowls are pressed from heavy gage 18-8 stainless steel. Both are available in roll rim or deep apron design, and pedestals of both have been streamlined to afford maximum accessibility to interior mechanisms by means of removable panels. Serving as many as eight to ten persons simultaneously, all metal fountains are available in 54 and 36 in. diameter sizes, circular or semi-circular, and hand or foot controlled.

Grinder: Bradford Machine Tool Co., Electrical Tool Division, Dept. 1-I, Evans St., Cincinnati 4, announces an electrical grinder of new design with

extra heavy duty motor, oversize ball bearings, semisteel guards made to meet American Standard and Safety Code, push-button station with starter having overload protection and under-voltage release, waterpot, tool tray and spark breakers. The grinder is one of a new line of electrical tools recently added by this company.

Centrifugal Casting News

Vol. 6 — CENTRI-MECO of KALAMAZOO — May '46

. . . BE READY When Designing Engineers Demand Centrifugal Castings

because . . . centrifugal castings can be made to closer tolerances, and in some cases "cast to size," designers are thinking of the tremendous savings represented in machining time.

because . . . centrifugal castings are sound and are of higher physical properties, designers are demanding them for their finished products.

because . . . centrifugal castings will give you the ideal combination of better products and a method suited to mass production, it will pay you to encourage this growing demand.

because . . . you will profit through greater yield! Produce castings instead of sprue, gates and risers. Accentuate production of sound clean castings this simple way without having to figure out skim-gates, slag-traps or swirl-gates. Cut scrap loss.

CENTRI-MECO Junior

LET US HELP YOU . . . we will gladly make an engineering survey of your plant without obligation!

CENTRIFUGAL MACHINE & ENGINEERING CO., KALAMAZOO 7, MICH.

At no extra engineering cost, you can have a Reading Electric Hoist that's CUSTOM-BUILT to solve your special materials handling problems.

The Reading Unit Construction Plan gives you a choice of several standard interchangeable mechanisms. With this plan you can select the type of suspension, control, hoisting and motor unit that best suits your job requirements. Imagine the advantages you get in a hoist "tailor made" to your own specifications! If your operating conditions change, you can modernize—and save costs—by simply changing one or two units.

See your distributor for more information on Reading's Unit Construction Plan or write us today for your copy of "144 Answers To Your Hoisting Problems."

READING CHAIN & BLOCK CORPORATION
2108 ADAMS ST., READING, PA.
CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

Fire Extinguisher: General Detroit Corp., 2270 East Jefferson Ave., Detroit 7, and General Pacific Corp., 1800 South Hooper St., Los Angeles 21, announce a carbon dioxide portable fire extinguisher for fighting fires in

electrical equipment, oil, grease and flammable liquids. The heavier-than-air carbon dioxide gas penetrates into remote corners, replacing oxygen necessary for combustion, thus smothering the blaze. Cylinder of the extinguisher is made of steel, with brass fittings. Discharge horn is of shock-resistant plastic construction. The extinguisher is available in a complete range of sizes from 2 to 100 lb.

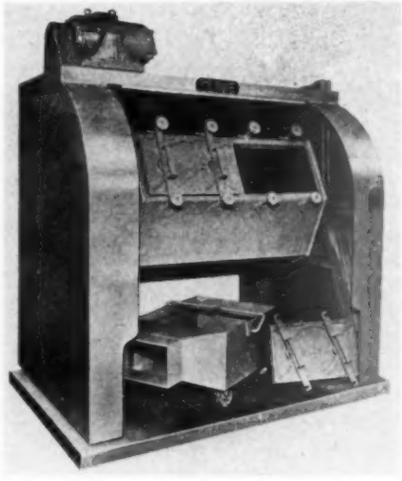
Power Regulator: Modern Control Equipment Co., 176 West Adams St., Chicago, announces a regulator, which, when connected to the lines of commercial power users, raises the power factor by taking the magnetizing current off the line and affords more power in relation to cost of current. Reactors and transformers are of dry type construction, and capacitors contain a non-inflammable liquid, eliminating fireproof enclosures. In addition to improving power factor the regulator improves voltage regulation, resulting in more efficient performance of all connected apparatus.

Marking Outfit: M. E. Cunningham Co., 97 Carson St., Pittsburgh 19, has developed a utility marking outfit especially adapted to stamping of brand names, lot and serial numbers on tools, machine parts and tags and for stamping stock numbers on metal bars and sheets. The holder is available in nine sizes with type recesses ranging from ½ to 1½ in. in length. Choice of recess depends upon desired number of characters to be marked. Type characters can be used in any size holder. Fractional characters are available for use with each size of type. Type is held securely in place by special locking pin of spring steel which allows for quick and easy type changing.

Masonry Cutter: Champion Mfg. Co., 1307 Washington Ave., St. Louis 3, offers an abrasive masonry cutting blade which is said to decrease cutting cost, lengthen blade life and increase cutting efficiency. The blade, which is jade green in color to ease operator eyestrain, is equipped with blotter for safety in operation and steel center for efficient operation and protection of machine shaft. It is available in 12 and 14 in. sizes to fit any type masonry cutting saw.

Vibration Control: Korfund Co. Inc., 48-15 32nd Place, Long Island City 1, N. Y., announces a simplified steel spring vibration isolating unit, designed in 26 sizes for rated loads of 75 to 12,000 lb. Adjustable resilient chocks in the four corners of the housing act as stabilizers. Properly installed and adjusted, the isolator provides vibration control for all impact machinery, stationary and marine diesel engines, generators, panel boards, material testing and processing equipment, recording apparatus, business machines, etc.

De-burring Machine: Globe Stamping Division, Hupp Motor Car Corp., Cleveland has designed a de-burring machine which features double and triple compartments that can perform polishing and de-burring operations simultaneously. Handling of parts has



been simplified by installation of a new hoist pan. Large light-weight doors make loading and unloading easier. The machine is available in a single compartment model with cubical content of 18.4 ft; in double compartment model, each compartment having a capacity of 9 cu ft; and in triple compartment model, each compartment having a capacity of 5.1 cu ft.

Supply of Pattern Lumber Short

Since the end of the war, many foundries have encountered greater difficulty in obtaining necessary materials than was the case during the emergency. The most recent shortage to threaten the industry is that of pattern lumber, and with the emphasis on home construction, the situation shows little sign of improvement.

In discussing the present problem with regard to pattern lumber, E. T. Kindt, president, Kindt-Collins Co., Cleveland, pointed to the fact that the nation's pattern shops are relatively small. They have no collective or individual representation in Washington. These plants are an unknown and forgotten part of the industry as far as Washington is concerned and therefore need the help of foundries themselves if this shortage is to be eliminated.

Mr. Kindt estimates that an approximate need of the pattern industry for a period of one year is in the neighborhood of 33 million board feet of pine suitable for pattern purposes. This is only about one-tenth of 1 per cent of the total production of lumber, but it is of vital importance to our national welfare.

As yet the industry has not been able to determine the precise cause for the existing shortage. Diversion of lumber to other purposes may be one factor, but it is also felt that price control through OPA may be retarding the production of lumber.

NFA Annual Meeting Plans Announced

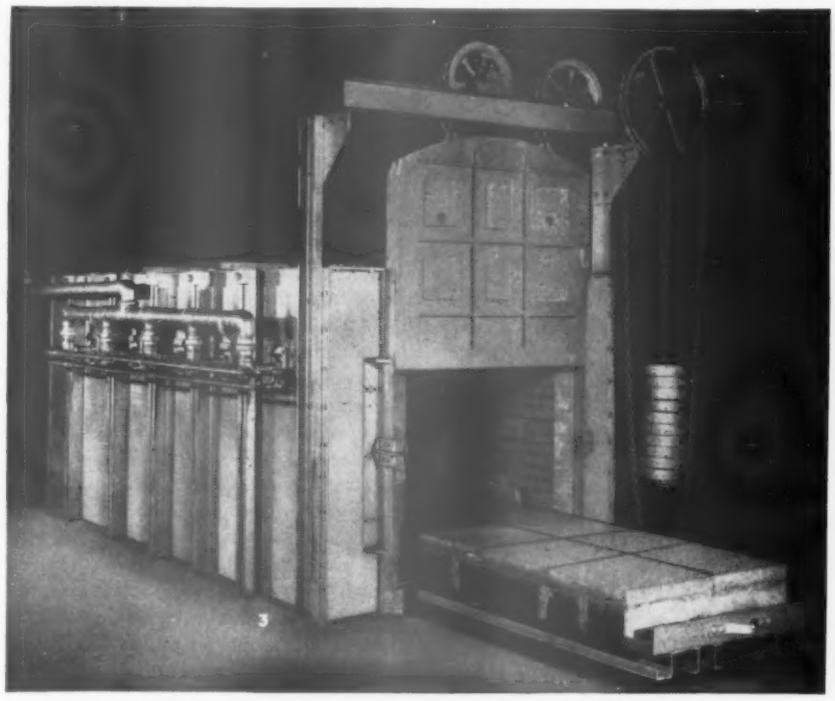
Forty-eighth annual meeting of the National Founders Association will be held at the Waldorf Astoria, New York, Thursday and Friday, Nov. 7 and 8. Meeting of the Administrative Council will be held on Nov. 6, and the Alumni Dinner will follow the council meeting. H. Menck, Harnischfeger Corp., Milwaukee, is president of the NFA and L. E. Roark is executive vice president of the association.

Will Enlarge Plant

Clayton-Sherman Abrasives Co., Detroit, manufacturer of steel shot and grit, has plans for doubling or perhaps tripling its production facilities by enlarging its plant and installing additional equipment. The expansion program was outlined by the company recently at a convention and banquet of plant executives, manufacturing group and Michigan sales division.

CARBOTTOM FURNACE particularly adapted to handling large castings. As designed by Bellevue engineers highly efficient and economical and subject to very accurate temperature control with automatic proportioning burner equipment. In comparatively small model shown, miscellaneous castings and forgings are heat treated. . . . Car type furnace can be had in various designs . . . over firing . . . under firing . . . recirculating type method.

Bellevue INDUSTRIAL FURNACE COMPANY
2971 BELLEVUE DETROIT 7, MICH.



FOUNDRY FACINGS **GRAPHITE** CORE WASH

ASBURY

KLEAN-A-KAST
AN OUTSTANDING SHAKON FACING

CARBON RAISING

PIPE REDUCER
CARBON AND NON CARBON

OUR FIFTY-FIRST YEAR

THE ASBURY GRAPHITE MILLS, INC.
MAIN OFFICE AND WORKS: ASBURY, N. J.

STOCKS LOCATED: CHICAGO, MILWAUKEE, DETROIT, DENVER, ST. LOUIS, HOUSTON, CINCINNATI, LOS ANGELES, SAN FRANCISCO, SEATTLE, PORTLAND, VANCOUVER

See us at Booth No. 319 at The Foundrymen's Convention

If You're Up In The Air about FOUNDRY DUST

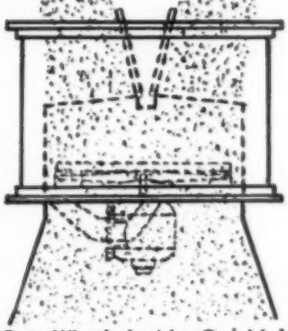
Remember!

You Can Put IT There with Powerful PROPELLAIR VERTI-STACKS

• • •

Dampers Open Wide . . . Offer Virtually Zero Resistance to the High-Velocity Discharge of These Efficient Power Roof Ventilators

WRITE TODAY



Puts What's Inside, Outside!

"MOVING AIR IS OUR BUSINESS"

PROPELLAIR INC SPRINGFIELD · OHIO

CONVERTER PROCESS IN STEEL FOUNDRIES

(*Continued from page* 174)

were used for final additions, they usually were mixed with the molten cupola iron used to bring up the carbon to the desired point.

After the alloys and the cupola metal were added to the steel, the converter was rocked back and forth a few times to facilitate thorough mixing, and the vessel charge was then poured into the steel ladle. The aluminum, in most cases, was thrown into the stream running from the converter, when the ladle was about one-third full.

In another place[6] the present author has pointed out the similarity between side-blown converter practice and that now recommended by leading authorities for making high quality steel in acid electric furnaces, and has drawn the conclusion that there is no reason to expect any difference between acid electric steel and that made in the side-blown converter. Such articles as that of Sims and Dahle[7] give ample confirmation of that view and prove that there is no difference in quality between steels made in the acid and the basic open-hearth furnace, the acid and the basic electric furnace, and the side-blown converter.

Cannot Reduce Phosphorus

In converter practice, of course, there is no means of reducing the content of phosphorus and sulphur in the steel, as the process is carried out in an acid-lined vessel, under an acid slag. Exactly the same thing is true of the acid electric and the acid open-hearth process. Phosphorus content in steel made by acid processes has always been controlled by the use of carefully selected low phosphorus pig iron and steel scrap. As the blowing loss in the converter is higher than melting losses in electric or open-hearth furnaces, the concentration of phosphorus in converter steel is greater than in open hearth or electric steels. In all acid processes, of course, the loss of iron, manganese, carbon and silicon, while all the phosphorus remains in the steel, results in an increase in the phosphorus content in conversion. It has always been regular practice to keep the phosphorus content within prescribed limits in all acid processes, however, so that in this respect converter steel is in no way inferior to steel made in acid electric or open hearth furnaces.

Reference to new methods of dephosphorizing converter steel in the steel ladle is here omitted, as when so treated the steel must be subjected to further treatment in an electric furnace and therefore is duplex, not true converter steel.

Previous to the 1920's, however, the converter operators were not so fortunate as regards sulphur. Because the converter charge is melted with coke in a cupola, and coke seldom contains much less than 0.80 per cent sulphur, there is a "pick-up" of some 0.01 to 0.03 per cent sulphur in the cupola. With the development of methods of desulphurizing the melted cupola metal by additions of fused alkalies in the cupola and in the ladle, this difficulty has been overcome, and today there is no marked difference in composition between side-blown converter, acid electric and acid open-hearth steels, as made for castings.

Subject Steel to Oxidation

Particularly from the standpoint of producing gas-free steel for castings, Sims[8] has outlined the best practice to follow in producing steel in the acid electric furnace. He states that the charge should melt comparatively high in carbon, and should be subjected to thorough oxidation by means of additions of scale or iron ore. (One is tempted to smile at the view once so strongly held that converter steel is necessarily of inferior quality because it is oxidized during its manufacture!) The resulting long, vigorous boil promotes the escape of dissolved gases, especially hydrogen, which are absorbed by the steel from the rust and moisture on the scrap of the charge, and probably from the atmosphere. A low silicon and manganese content at the end of the boil should be attained, and are a proof that oxidation has been thorough. The deoxidation should be carried out in the furnace, and toward the very end of the process the temperature of the metal should not be too high; and particularly, no increase of temperature after deoxidation should be permitted.

It is obvious that in the side-blown converter, a bath melted high in carbon is subjected to thorough oxidation and a long vigorous boil, is finished at a low content of silicon and manganese, is deoxidized in the vessel at the very end of the heat at not too high a temperature, and no increase in temperature after deoxidation is even possible. Given proper chemical composition, steel made in a side-blown converter by the methods described in this article should be, and in fact is, of excellent quality and quite free of the tendency to wildness in the molds.

It remains to discuss the probable reasons for the difficulties encountered, as already mentioned, in trying to make carbon steel castings of steel below 0.35

per cent C, in the small bottom-blown converter. The steel so made was undoubtedly not as hot, on the average, as side-blown steel, and at the same time it had a pronounced tendency to evolve gas in solidifying in the molds. As described previously, even with the Swedish practice of blowing high-manganese charges, the present author found it extremely difficult, if not impossible, to produce hot carbon steel of this class that would not "rise" in green sand molds from the evolution of gas as the steel solidified. These "wild' heats would at first lie quiet in the heads and freeze over with a smooth surface. Soon, however, little spits of liquid metal would begin to be rejected through the frozen crust, and in a short time a typical "cauliflower head" would be built up. The casting beneath, of course, contained numerous gas pin holes. This difficulty is seldom encountered with steel made in side blown vessels, and never to the same extent.

This "cauliflower head" is identical with what Zapfe[9] calls "bleeding" of steel castings, and which he ascribes to the evolution of hydrogen (and in some cases nitrogen) liberated from the steel in solidifying. In his view, dissolved hydrogen in the steel reacts with any iron oxide not reduced by silicon, manganese and aluminum, forming water vapor by the reaction $2\,H + FeO = H_2O + Fe$. The water vapor forms gas bubbles in the steel and into them further quantities of hydrogen are evolved from solution in the metal, thus greatly enlarging the bubbles.

Pin Holes Caused By Water Vapor

Sims and Zapfe[10] had set forth the same view in discussing the origin of pin holes in cast steel, with the added detail that they believe water vapor from the sand of the mold can assist in producing a similar result. According to their belief, the water vapor from green sand molds first reacts with the surface of the steel, forming atomic hydrogen and FeO, by the reaction $H_2O + Fe = FeO + 2H$. This atomic hydrogen is readily absorbed by the steel and then reacts with any unreduced Fe in the metal by a reversal of the foregoing reaction, $2H + FeO = H_2O + Fe$, thus forming water vapor in the metal.

Just as postulated by Zapfe, this water vapor forms bubbles in the steel, into which hydrogen in solution is then liberated, enlarging the bubbles. In this way Sims and Zapfe explain the familiar phenomenon of subsurface pin holes, melon-seed shaped, that are sometimes found in steel castings made in green sand molds, especially at re-entrant angles where a point of sand projects into the

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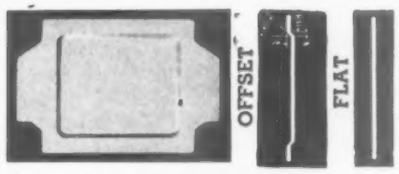

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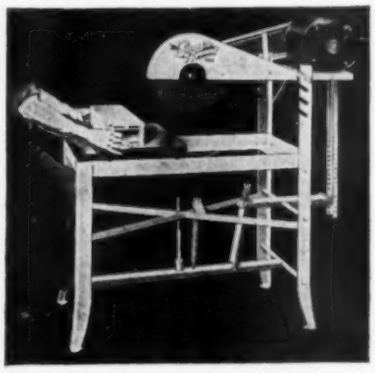

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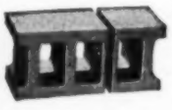

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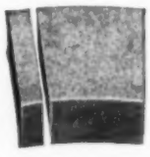

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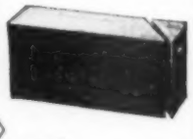

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body of the steel. Naturally at such a point the rate of evolution of water vapor from the sand is greater than on flat surfaces, so that this is the point where these pestiferous pin holes are most often found.

Wildly-rising heats of carbon steel made in the bottom-blown converter, as already described, can hardly be accounted for by the evolution of water vapor from the molds, and are rather due to hydrogen absorbed by the metal during the blow. As Sims' states in "Preparation of Steel To Avoid Porosity in Castings," the way to prevent the retention by the steel of quantities of hydrogen in solution, is to subject the metal to a long vigorous boil by the oxidation of carbon with iron ore or scale. The reaction $C + FeO = CO + Fe$ evolves large quantities of CO, the boil being due to this evolution of gas, and the rising bubbles of CO provide an opportunity for dissolved hydrogen to come out of solution and be carried out of the metal. It is then further necessary to completely deoxidize the steel by means of silicon, manganese and aluminum, so that there will be no FeO remaining to start the reaction $FeO + 2H = H_2O\ Fe$, which permits the evolution of hydrogen as the steel freezes, and the formation of pin holes.

Difference Between Converters

At first glance it would seem as if there could be little difference between conditions in the two types of converter, so far as the purifying boil is concerned. In both processes, atmospheric oxygen oxidizes the carbon of the metal and the resulting evolution of CO gas produces a vigorous boiling action. Obviously, a greater tendency prevails in both processes to absorb hydrogen from the water vapor present in the atmosphere, than in electric furnaces, because in a converter a blast of air is constantly either directed upon the surface of the steel, or actually forced through it. In both types of converter the tendency to absorb hydrogen from the water vapor in the air, which is produced by the reaction $H_2O + Fe = FeO + 2H$, is greatest in the early stages of the blow before CO is evolved to wash out the hydrogen. Obviously, in the bottom-blown vessel, where the air is forced through the steel, this tendency to absorb hydrogen is greater than in the side-blown vessel, where the air is directed only upon the surface of the bath, and comes in less intimate contact with the mass of the metal. Moreover, in the bottom-blown vessel, even when the carbon is burning and the bath is agitated vigorously by the evolution of CO, the steel is exposed continuously to the air blast, so that the hydrogen washed out by the CO is replaced constantly by quantities absorbed from the air.

As already described, the boiling in the side-blown converter probably is due in quite large part to the reaction of the FeO in the slag with the carbon of the steel. This is true both in the boil that occurs early in the blow and in the vigorous reaction that marks the final flame period. The air pressure is reduced during these periods, and the quantity of air blown is greatly diminished. Moreover, the air reaches only the upper portion of the freely-boiling bath. Undoubtedly, conditions in the side-blown converter much more resemble those in the electric furnace than do the conditions in the bottom-blown vessel. It naturally would be supposed, then, that the steel made in the bottom-blown vessel would contain more dissolved hydrogen (and possibly also nitrogen), than side-blown steel.

It is true that the moisture on the lumps of ferromanganese and ferrosilicon thrown into the side-blown vessel as final additions carry a little hydrogen into the steel, but the amount so absorbed cannot be very large.

It should be added, too, that the method of adding the deoxidizers to the bottom-blown steel, as already described, was not the best to secure a low final content of dissolved FeO. The aluminum being tossed into the stream of blown metal running from the converter was in part wasted by doing the work of reducing FeO that should be initiated by the silicon and manganese. The latter, in the methods described, being contained in the molten alloy in the bottom of the steel ladle, obviously did their share of the deoxidation simultaneously with the aluminum, instead of ahead of it.

Aluminum Added Last

By way of contrast, in side-blown practice, the silicon and manganese were mostly added in the converter and allowed time to react before the aluminum was added. The aluminum, added at its proper time after the other deoxidizers had had a chance to do their part, was thoroughly effective in reducing the FeO to a properly low content. Thus there was undoubtedly less FeO in the side blown steel to start the $2H + FeO = H_2O + Fe$ reaction.

As the bottom-blown steel in all probability contained more dissolved hydrogen than the side blown, and at the same time was less thoroughly deoxidized, conditions were such that the bottom-blown metal would be expected to be wild in the molds. Additional amounts of aluminum, introduced into these wild heats after they were partly

poured, by tying bars of aluminum to a rod and thrusting it through the slag, seldom served to cure the evolution of gas. From this it may be inferred that the difficulty was due more to excessive amounts of dissolved hydrogen than to insufficient deoxidation.

Austenitic (12 per cent) manganese steels, made by mixing molten ferromanganese with metal from the bottom-blown vessel, never showed evidence of gassiness in solidifying. To some extent, of course, this is due to the fact that the very large additions of manganese tend to greatly reduce the FeO content of the steel. Thus, of some 14 per cent Mn commonly added to the steel, an average of about 12 to 13 per cent remains, indicating a more thorough reaction with the FeO than occurs when smaller amounts of manganese are added, as in making carbon steels. More important, however, is the fact that hydrogen is freely soluble in both liquid and solid autenitic steels, and there is no sudden decrease in solubility at the freezing point, as there is in carbon steels. It would naturally be expected, therefore, that austenitic manganese steel, made from either bottom-blown or side-blown converter, or for that matter of electric furnace steel, would show no signs of gassiness, and in fact it never does.

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8. *Transactions*, American Foundrymen's Association, Vol. 42, 1934, page 323.
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10. *Transactions*, American Foundrymen's Association, Vol. 49, 1941, page 255.

To Improve Foundry Techniques

At the suggestion of the 58 foundries in British Columbia, Canada, the British Columbia Industrial and Scientific Council has arranged for a foundry station at the Vancouver Technical School where foundry production problems are to be studied. Development of molding sands from local deposits, studies to improve foundry operations, problems in heat treating and melting and development of suitable coke for foundry use are subjects for investigation.

Opens Branch Office

Charles J. Scullin, foundry consultant with headquarters in St. Louis, has opened a branch office at 420 Lexington, Ave. New York.

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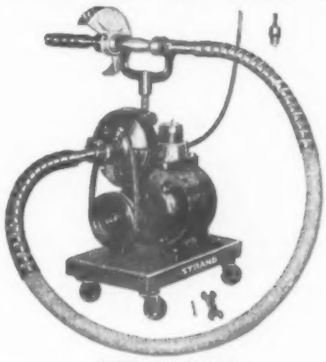

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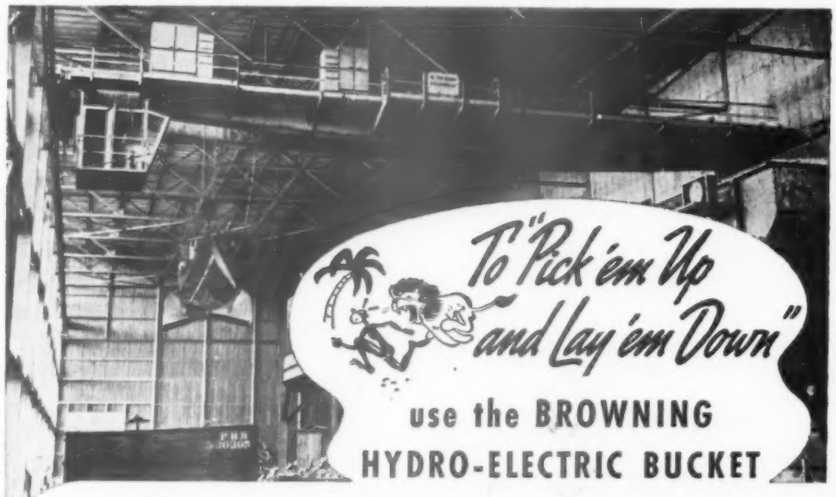

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CAST IRON CUTTING: Technical Service Dept. of National Cylinder Gas Co., 205 West Wacker Drive, Chicago 6, has issued an illustrated circular, N-606, describing the cutting of cast iron with the oxy-acetylene flame. Included is discussion of proper types of equipment, preheating conditions, cutting positions, need of adequate protective clothing, proper oxygen and acetylene pressures, etc.

ELECTRODES: Eccles & Davies Machinery Co. Inc., 1910 Santa Fe Ave., Los Angeles 21, offers a 16-page colorful booklet which describes in detail the physical and chemical properties of phosphor bronze electric welding rods. Techniques for welding copper, bronze, cast iron, steel and their alloys are given, together with a polarity table and directions for best welding results.

RECORDING INSTRUMENTS: Catalog 370, recently issued by the Foxboro Co., 32 Neponset Ave., Foxboro, Mass., presents a full line of recording and indicating instruments for measurement and control. Arranged for quick reference, illustrations and descriptive matter covering instruments for temperature applications, pressure, humidity, flow, liquid level, density and other process variables, are given, including control valves, planimeters, instrument accessories and supplies.

LIQUIDIZER: Pittsburgh Metals Purifying Co., 1352 Marvista St., Pittsburgh 12, has published a 4-page leaflet describing a carbon free liquidizer for steel, gray iron, monel, bronze, copper castings and ingot molds. Directions for applying the liquidizer on feeder heads or risers are supplied.

BRONZE TABLETS: Pan American Bronze Co., 628 Sycamore St., Cincinnati 2, has available a new circular which illustrates cast bronze honor roll plaques which are being offered for perpetuating the memory of members who served with the armed forces.

BEARING ALLOYS: Federated Metals Division, American Smelting & Refining Co., 120 Broadway, New York 5, offers a new 36-page booklet entitled "Bearing Alloys Technical Manual," intended to present information to assist engineers and consumers of bearing alloys in the design, construction and maintenance of friction-type bearings for all kinds of machinery. Subjects covered include the history of bearing metals, significant developments, effect of composition on bearing alloys, melting and casting of bearing alloys, bonding of bearings, and causes of bearing failure. Navy Department, federal, ASTM and SAE specifications are tabled, together with melting range of tin-lead alloys and melting point of metals.

INDUCTION FURNACES: Ajax Electrothermic Corp., Trenton 5, N. J., has published a 16-page bulletin, No. 11-B, which describes high-speed precision melting of alloy steels and other ferrous metals in furnaces from 120 lb to several tons capacity, powered by efficient motor generator units from 50 kw up. Helpful hints in planning an efficient shop and a table showing proper equipment to maintain any given production schedule are included.

LUBRICATION: Alemite Division of Stewart-Warner Corp., Chicago, has recently published a book entitled "Alemite Answers," designed to translate consumers' questions regarding lubrication, into manufacturers' answers. Divided into seven chapters, the volume explains petroleum and its chemistry, refining and testing of fuels and lubricants, demonstrates application problems and solutions and defines purchasing and selling. The book is for destribution at $3 per copy through the Alemite distributor organization.

PRECISION CASTINGS: Austenal Laboratories Inc., 5932 Wentworth Ave., Chicago 21, has published an interesting 8-page brochure, "Microcast Process," which describes the application of precision casting technique for the production of castings of intricate design, wherein accurate dimensions, surface smoothness and sound structure are essential. Description of the process is given as well as ranges and types of castings produced which include wearing plates, turbine blades, motor parts, aluminum connectors, etc.

NICKEL ALLOYS: International Nickel Co. Inc., 67 Wall St., New York 5, has published Revised List "A" of current publications on nickel alloy steels, nickel cast irons, nickel brass and bronzes and nickel plating. Publications offered cover the production, fabrication, properties and uses of nickel alloys for industrial applications, and the production, properties and use of nickel electrodeposits.

FOUNDRY NOTES: Carpenter Brothers Inc., 606 West Wisconsin Ave., Milwaukee 3, has resumed publication of "Foundry Notes," prepared for filing in loose leaf binder, for the information of those interested in foundry products. Pertinent facts relating to foundry subjects are covered in the circular which is available upon request.

MOLD SPRAY: Naval Stores Dept., Hercules Powder Co., 999 Market St., Wilmington 99, has available Form No. 400-301 5M 1-45, a compact circular which describes a new solvent-type mold

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FOUNDRY EQUIPMENT: American Foundry Equipment Co., 505 South Byrkit St., Mishawaka, Ind., has published a 24-page reference catalog, No. 40, which presents a detailed summary of products such as blast cleaning equipment, tables and special cabinets, air-blast rooms, shot peening equipment, metal washing equipment, rod straighteners, shear machines, etc. Included are operating views of typical installations in leading industrial plants.

CRANES: Harnischfeger Corp., 4405 West National Ave., Milwaukee 14, offers Bulletin C9-1, which describes grab bucket cranes built for service on all types of jobs. Construction details are given and industrial applications are illustrated. The cranes are widely used in metalworking industries for handling bulk materials such as ores and solid fuels.

INDUSTRIAL TIRES: B. F. Goodrich Co., Akron, offers a complete 40-page catalogue, "How to Save Money on Industrial Hauling Jobs and Equipment," which contains illustrations and specifications of commercial cushion, heavy duty, wheelbarrow, pressed-on tires and retreads together with replacement parts. Tire care and maintenance manufacturers' specifications are included.

MANAGEMENT ENGINEERING: Methods Engineering Council, 822 Wood St., Pittsburgh 21, has available a new 20-page brochure which describes in detail the functions of modern management engineering. A section on general management services is followed by discussions of the council's work in methods engineering, training, plant layout and design, job evaluation, wage incentive plans and personnel appraisal.

AIR-OPERATED TOOLS: A new edition of its air-operated devices catalog is offered by Mead Specialties Co., 4120 North Knox Ave., Chicago 41, which includes several items made available to industry for the first time. Presses, vises, collet fixtures, feeders, filter and pressure regulators, hand and foot control valves, manifold for distributing air and actual examples of various air power set-ups are included.

PAINT: Peninsular Chemical Products Co., 6795 East Nine Mile Rd., Van Dyke, Mich., has published an illustrated bulletin, which gives complete information on a new quick-drying, odorless, chemical-resistant maintenance paint which is readily applied to heated, wet and porous surfaces of all kinds. Unretouched photographs of test strips demonstrate the protection provided by a single coat of the paint against hot acids, alkalis and water.

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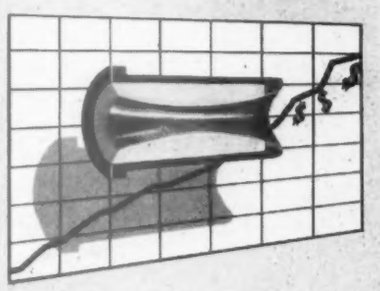

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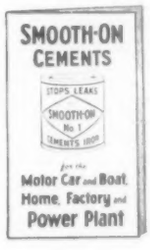

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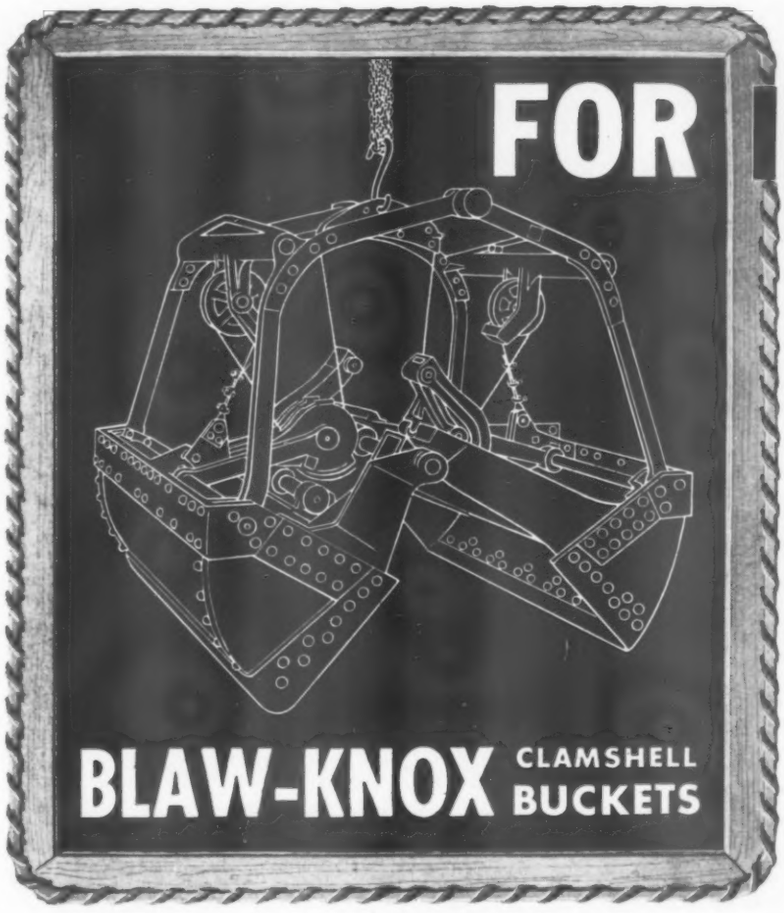

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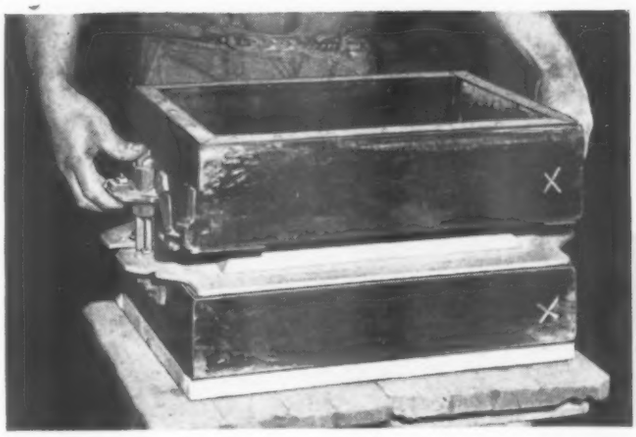

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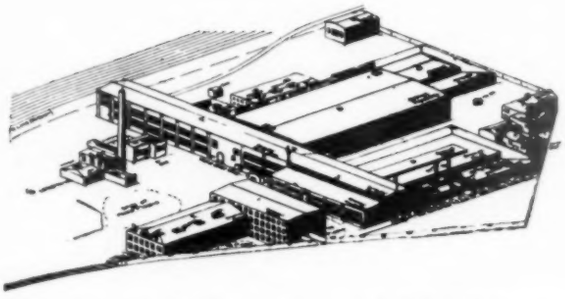

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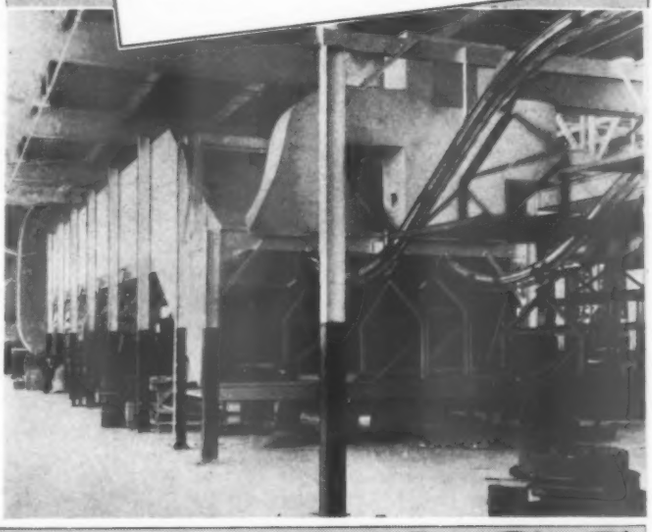

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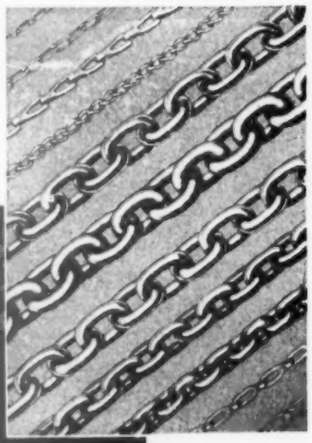

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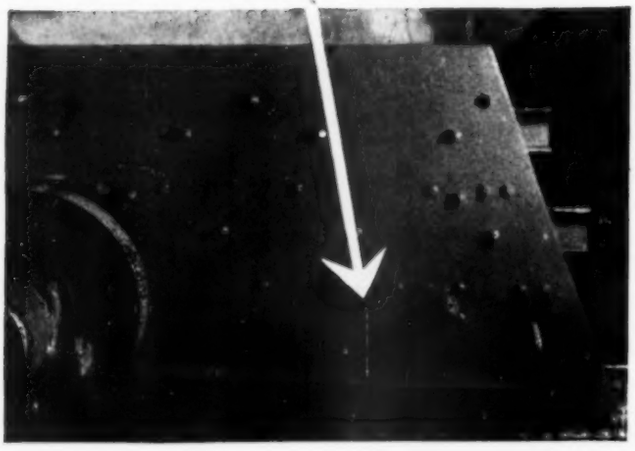

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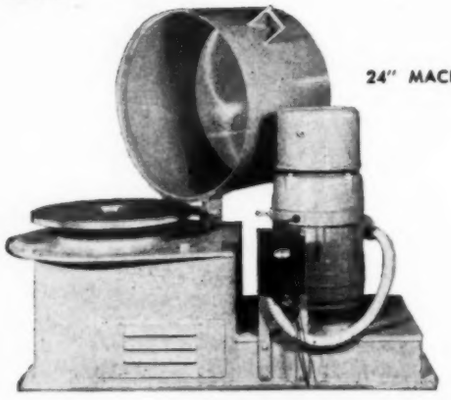

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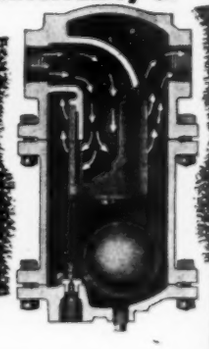

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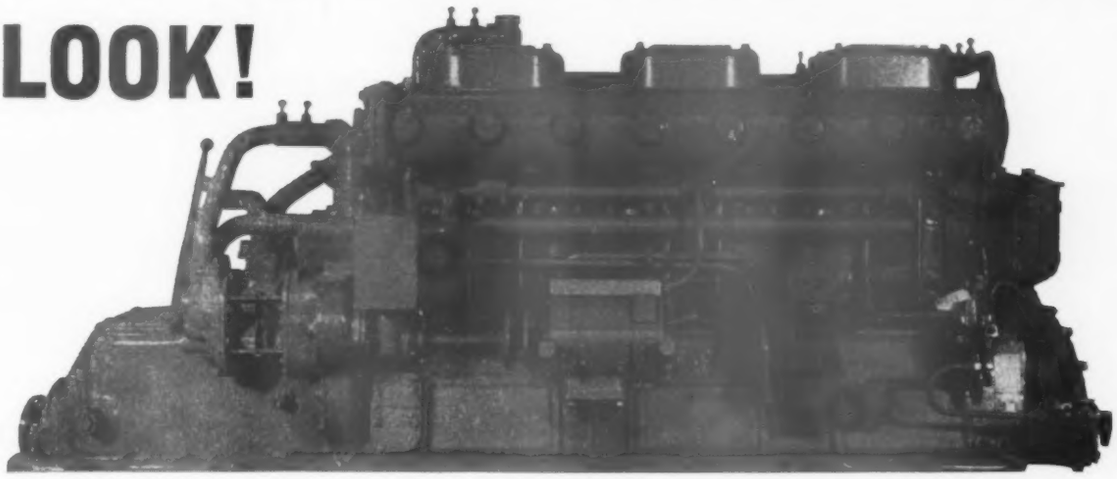

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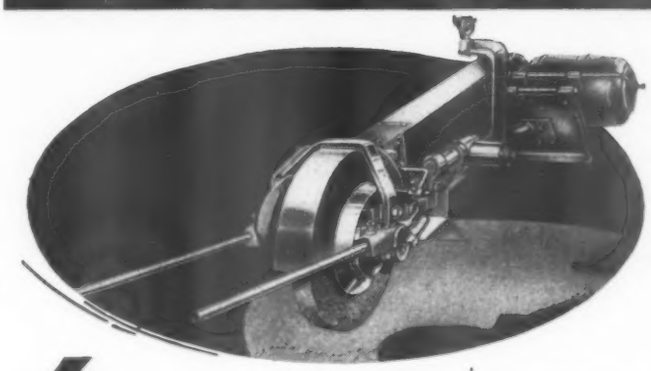

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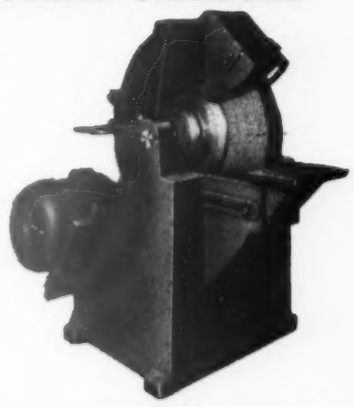

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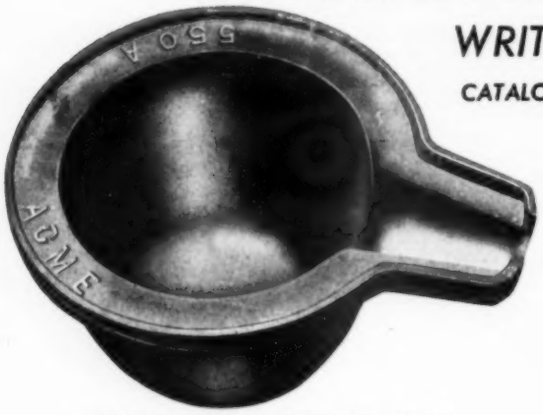

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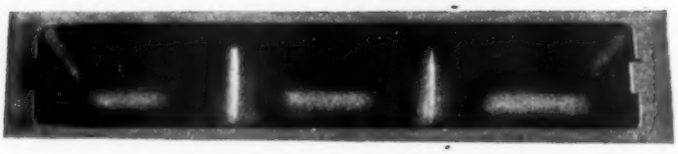

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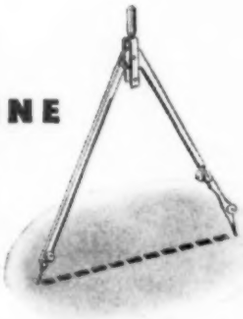

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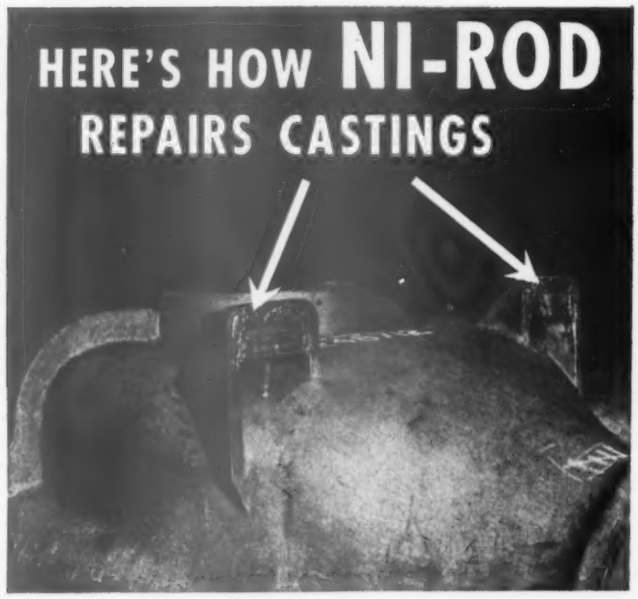

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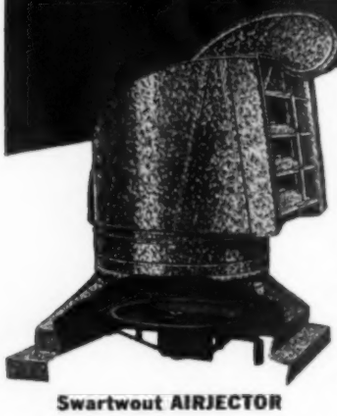

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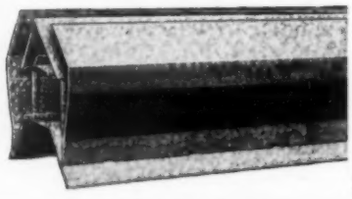

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MICAWASH and MICAPARTE for core and mold washes—also parting compounds —for all ferrous and non-ferrous alloys. (Contain no free silica.)

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HELPFUL LITERATURE

***NOTE TO READERS:** If you will check the item or items described which particularly interest you, we will be glad to request the manufacturers concerned to send you their literature. Use the attached postal card*

1. Conveyor Lubricators

J. N. Fauver Co.—4-page illustrated bulletin No. CL345 presents design and application data on automatic conveyor lubricators which lubricate every trolley wheel bearing and every chain link pin, each trip. Frequently measuring lubrication is provided.

2. Arc Welding Electrodes

Wilson Welder & Metals Co.—32-page illustrated catalog is guide for electrode users in selection of proper electrode for any specific arc welding operation. Specifications of complete line of electrodes for all types of work on wide variety of base metals are given and approved welding procedures for each application are described.

3. Machine Tools

Delta Mfg. Co.—72-page illustrated catalog No. 14 gives details on line of production machine tools which includes drill presses, abrasive cut-off machines, surface grinders, abrasive finishing machines, band saws, circular woodworking saws, jointers, scroll saws, woodworking shapers and woodworking lathes.

4. Air Compressors

Ingersoll-Rand Co.—24-page illustrated booklet No. 1011 entitled "A Little Air Power Will Do Many a Big Job" is designed for use of shop men to gain helpful ideas for their own use. Nearly seventy photographs show how to put familiar air-operated equipment to work in new ways, or use compressed air to increase production and secure greater economy.

5. Reverberatory Furnace

Stroman Furnace & Engineering Co.—4-page illustrated bulletin No. 501 is descriptive of Sklenar improved reverberatory furnace which is designed for melting brass, aluminum, copper and other alloys. Capacities range from 350 to 10,000 pounds of brass.

6. Vacuum Cleaners

Allen Billmyre Co.—12-page illustrated bulletin No. F-4 gives data on line of Exidust portable vacuum cleaners which are designed for cleaning floors, walls, crevices, machine parts, pipes and structures. Various sizes and capacities are available.

7. Materials Handling

Elwell-Parker Electric Co.—Four illustrated bulletins showing types of loads and economical methods of handling them are supplements to booklet "Industrial Logistics." Raw materials, semi-finished products handled in boxes, barrels, bags, bales or similar packages are discussed. Assembling of containers into master unit loads or pallets or skids and transporting them as unit are covered.

8. Friction Sawing

DoALL Co., Machine Tool Div.—24-page illustrated "Friction Sawing" booklet describes this new technique which uses high speed sawing machines to cut and shape ferrous materials. Cutting rates, radii cutting factors, tube sawing and finish are covered. Reference data are given to guide in selecting proper sawing factors in cutting steel, armor plate, stainless, illium, cast steel and cast iron.

9. Grinding Wheels

Norton Co.—6-page illustrated folder on No. B-5 resinoid wheels for foundry grinding applications contains condensed data on styles for swing frame grinders, floor stands, portable grinders and disk grinders. Dimensions and list prices are given on commonly used shapes and sizes.

10. Foundry Engineering

A. A. Wickland & Co.—2-page catalog reprint describes services offered by this firm of foundry engineers which is experienced in plant layouts, production studies, design of special machinery, and development of tools and equipment.

11. Binder

Delta Oil Products Co.—4-page bulletin presents advantages and properties of Delta Bondite organic binder for skin dry, dry sand and green sand molds and cores. Two per cent binder and 98 per cent 50-mesh and dried silica sand produce 20-pound hot strength in 12 minutes at 2500 F.

12. Fuel Heat Data

J. O. Ross Engineering Corp.—4-page illustrated bulletin "We Think You Ought To Know" discusses importance of choosing most suitable source of heat for processing requirements. Heat Comparison chart shows number of heat units obtained for 1 cent from electricity, manufactured and natural gas and oil at various selling prices.

13. X-Ray Equipment

North American Philips Co.—12-page illustrated bulletin "Norelco Industrial X-ray Equipment" gives data on units for fluoroscopy, radiography, diffraction and spectrometry. Various machines are described and application chart shows which equipment is best suited for inspection of specific parts or materials.

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14. Arc Welding Accessories

Air Reduction Sales Co.—12-page illustrated bulletin No. 130 describes complete line of arc welding accessories which includes electrode holders, graphite electrodes, welding cable, cable connectors and cable lugs. Also listed are welding helmets, goggles, face shields, headgear, aprons, gloves and sleeves. Heliwelding equipment for welding magnesium is described.

15. Molding Machine

International Molding Machine Co.—4-page illustrated bulletin describes International type JDP jolt ram, power pin lift machine which is equipped with vibrator, cleaner valve and automatic lubrication. Typical operations with this readily adjustable unit are shown.

16. Abrasive Head

Vonnegut Moulder Corp.—Illustrated bulletins No. 53 and No. 52 describe and give operating data on new brush-backed sander and abrasive head which is adaptable for wide range of finishing operations on plain and irregular surfaces. Coiled strips of abrasive cloth can be fed into position as wear occurs.

17. Gravity Conveyors

Rapids-Standard Co.—16-page illustrated catalog on Rapid-Wheel gravity conveyors shows typical applications of these units which are designed for handling of packaged goods and parts which will roll over ball bearing wheels. Units are portable and light in weight. They can be set up when needed. Also described are portable power belt conveyors.

18. Industrial Radiography

Canadian Radium & Uranium Corp.—80-page illustrated manual "Industrial Radiography With Radium" is concise textbook on practical use of this method. Procedures, technical data, Gamma-ray technique and advantages, interpretations, film processing and related subjects are covered.

19. Pyrometers

Claud S. Gordon Co.—Two 2-page illustrated data sheets on XacTemp pyrometers describe instruments for making temperature readings of molten metals and for accurate temperature measurements in heat treating and fabrication applications. Self-contained and fully portable, these instruments have range of up to 2500 F.

20. Industrial Tractors

W. F. Hebard & Co.—16-page illustrated catalog on Shop Mule industrial tractors gives specifications and other information on line of International Harvester powered units which are designed to facilitate materials handling. Wide range of sizes, types and capacities is available. Accessories for use with tractors are shown.

21. Aluminum Alloy

National Smelting Co.—8-page illustrated bulletin "Allcast Aluminum Alloy" gives history, principal advantages, mechanical properties and recommended applications of this general purpose aluminum alloy. Nominal composition is 3 per cent copper and 5 per cent silicon.

22. Core Binder

E. F. Houghton & Co.—4-page illustrated bulletin "Hy-Ten Dry Core Binder No. 100" lists characteristics of this binder which permits faster baking at lower temperatures and also affords quick shakeout. Case histories of applications of this core binder for nonferrous casting are quoted.

23. Chain Slings

Hercules Sling Co.—4-page illustrated bulletin entitled "Hoist With Safety" outlines advantages of Safe-T-Lift automatic-equalizing chain sling which is available in capacities of 4 to 40 tons. Self-adjusting to any load, sling has safety factor of 4 to 1 at 45-degree angle.

24. Flasks & Accessories

Chicago Mfg. & Distributing Co.—4-page illustrated bulletin presents data on line of floor and bench flasks, cross bars, wedges, bottom boards and nonburn jackets. Specifications are given on these units which are available in practically all required sizes.

25. Industrial Trucks

Automatic Transportation Co.—4-page illustrated bulletin No. 1001 describes Transportation platform type and fork type industrial lift trucks. Specifications and features of battery-powered trucks manipulated entirely from handle grip are given.

26. Alloys

Baldwin Locomotive Works, Cramp Brass & Iron Foundries Div.—44-page illustrated, plastic-bound bulletin No. 194 is engineering reference catalog of all types of ferrous and nonferrous alloys poured, and directory of products made by this company. Composition, applications and physical properties of alloys are given.

27. Nonferrous Melting Furnace

Ajax Electrothermic Corp.—16-page illustrated bulletin No. 26 describes high speed, precision melting of nonferrous metals in Ajax-Northrup induction furnaces. Both lift-coil and tilting-coil types are described. They range in size from 120 pounds up and are powered by motor-generator sets rated 50 kilowatts and up.

28. Air Motors

Bellows Co.—8-page illustrated bulletin "Bellows Air Motors" shows typical uses of these reciprocating air cylinders which are adaptable for operations involving pushing, pulling or lifting. Wide range of sizes, stroke lengths and accessories is available for power applications. Motors are double-acting and easily controlled.

29. Color in Industry

McDougall-Butler Co.—9-page illustrated technical bulletin "New Concepts of Color" shows how color selection and correct application can improve efficiency, health, safety and comfort of those working in industrial plants. Combination of proper painting and lighting for factory use is explained. Recommended colors for walls, ceilings, machinery and specific plants are covered.

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A typical installation showing sturdy, simple construction of RAPID Molding Machines and convenient and fast accessibility of controls and all working parts.

Fast!

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Economical!

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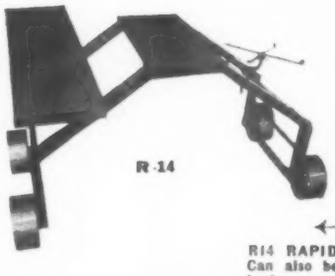


R-14

★

PORTABLE HAND SQUEEZER (R-10)—→

R10 RAPID Portable Hand squeeze machine is ideal for foundry doing simple pattern work. Many brass, aluminum and gray iron foundries finding these machines are increasing their production 200% to 300% over bench work. This machine can be equipped with a knee valve for vibrating, but is not standard equipment. Comes complete with core and tool shelve. Also equipped with riddle rack. Designed to straddle a sand pile, 54" wide and 27" high.

R-10

←—PORTABLE MOLDING BENCH (R-14)

R14 RAPID Moulding Bench is designed for straddling sand piles. Can also be used against walls. Available with knee valves for vibrators as equipment. Portable for moving from one place to another yet it is sturdy and practical.

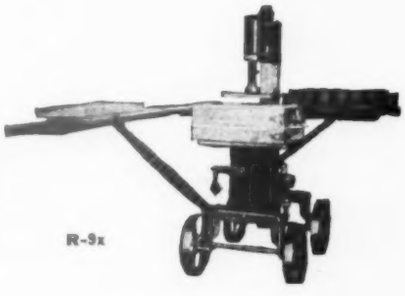
←—STATIONARY JOLT SQUEEZERS (R-6; R-7)

R6 RAPID machine has a long rail to be set in a concrete base on a dirt floor. R7 RAPID machine has a shorter rail and is designed to be mounted against a wall on a permanent floor. A base is provided on the end of the column along with clamps to fasten the rail to the wall. Both R6 and R7 machines are a COMBINATION JOLT AND SQUEEZE type. A hand lever operates the squeeze while a knee valve operates the jolt. Also is equipped with knee valve for vibrator (less vibrator) air gun and hose for same.

R-6 & R-7

PORTABLE JOLT SQUEEZER (R-9x)—→

R9X RAPID JOLT SQUEEZE MOLDING MACHINE is equipped with a larger jolt cylinder than the regular Rapid machines giving it an additional 30% jolt capacity. Comes equipped with knee valves for operating jolt and vibrator. Vibrator is not standard equipment. Hand operated squeeze valve. Illustrated below is the R9X machine in a medium sized aluminum foundry. Special size bench plates are available. AIR PRESSURE REGULATOR and Air Filter can be put onto any Rapid machines.



R-9x

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If, instead, your belts add to your troubles, then you'll be benefited by getting the performance records on—

SAHARA for hot sand-handling . . .

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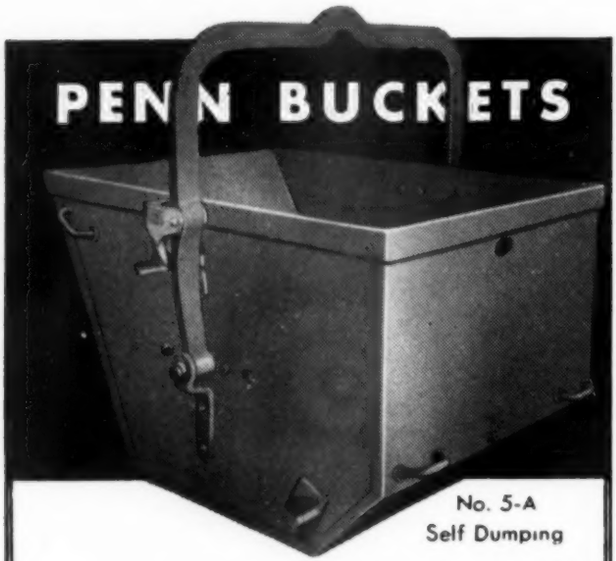

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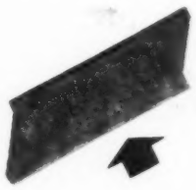

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The past four years scores of foundries have installed N & F super-concrete stave bins—obtaining suitable priorities, no problem for such essential equipment.

You, too, may need bins—need them badly—to

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Made in Standard Colors as Recommended by AFA.

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That's because this special formula synthetic alcohol soluble varnish is specially developed for the job. Oils, water, waxes, kerosene and gasoline just can't penetrate it! Put it on and you're *protected* for sure!

Easy To Apply! Hardlac goes on easily and dries quickly with a smooth, even surface. Sand will not cling to it!

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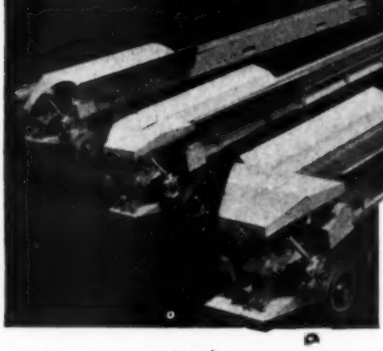

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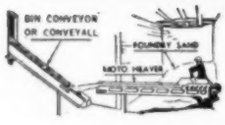

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Progressive foundries are now using the versatile MOTO-HEAVER to increase sand handling efficiency. This conveyor unit requires only one man operation and is powered by an electric motor. All motors and conveying mechanisms have a dust proof bearing construction. Three models to suit any purpose. Complete information as to cost and specifications will be sent on request.

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Radium has become a new foundry tool which directly effects an increase in yield. It permits accurate determination of the proper procedure in gating and risering "tough" castings. Seventeen cylindrical castings were radiographed simultaneously by Crane Co. to ascertain the most productive and economical foundry practice.

Radium thus performs a valuable additional function.

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The rental includes full coverage insurance, heavy lead storage containers and slide rule exposure calculators.

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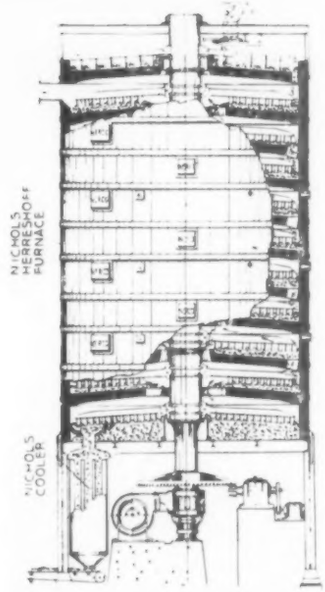

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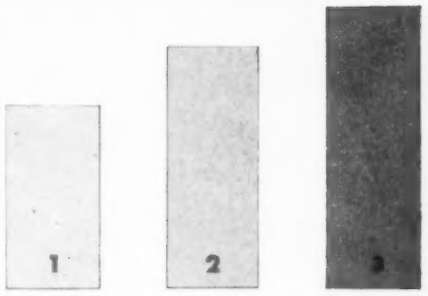
Low in first cost and upkeep, requiring little floor space and simple to operate, the Nichols System can be operated to show recoveries of 95 to 98 per cent.

There is a Nichols Sand Reclaiming System for your individual needs, either for thermal processing exclusively, or in combination with scrubbing and classifying.



Comparison of Reclamation Methods:

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Years have proven BINDARENE highly efficient in foundry production. Its adaptability to either light or heavy work, plus cost saving qualities, have made BINDARENE favorably known to Foundrymen for 37 years.

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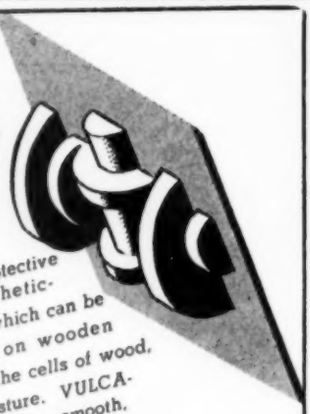
FOR CLEANER CASTINGS AND LONG PATTERN LIFE



VULCABOND protective coating is a synthetic-rubber-base liquid which can be painted or sprayed on wooden patterns. It penetrates the cells of wood, seals them against moisture. VULCABOND dries quickly, leaving a smooth, dense surface that helps to keep sand from adhering to the pattern when it is drawn from the sand. Patterns coated with VULCABOND are not affected by heat, acid, alkalis, steam, oil, gasoline or alcohol. VULCABOND resists wear

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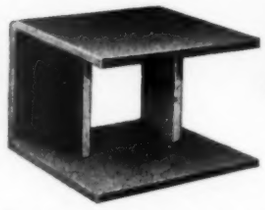

The extra strength of this exclusive *Angle Design* (originated and patented by Combined Supply and Equipment Co.) permits the use of these Buffalo Chaplets in thinner gauges.

Direct advantages are the ability to burn in more easily and a greater resistance to chilling.

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Your requirements may be met with Buffalo "Angle Stem" (Single) or "Double Angle" Chaplets, in a range of four metal gauges. Complete information, samples and prices promptly furnished.

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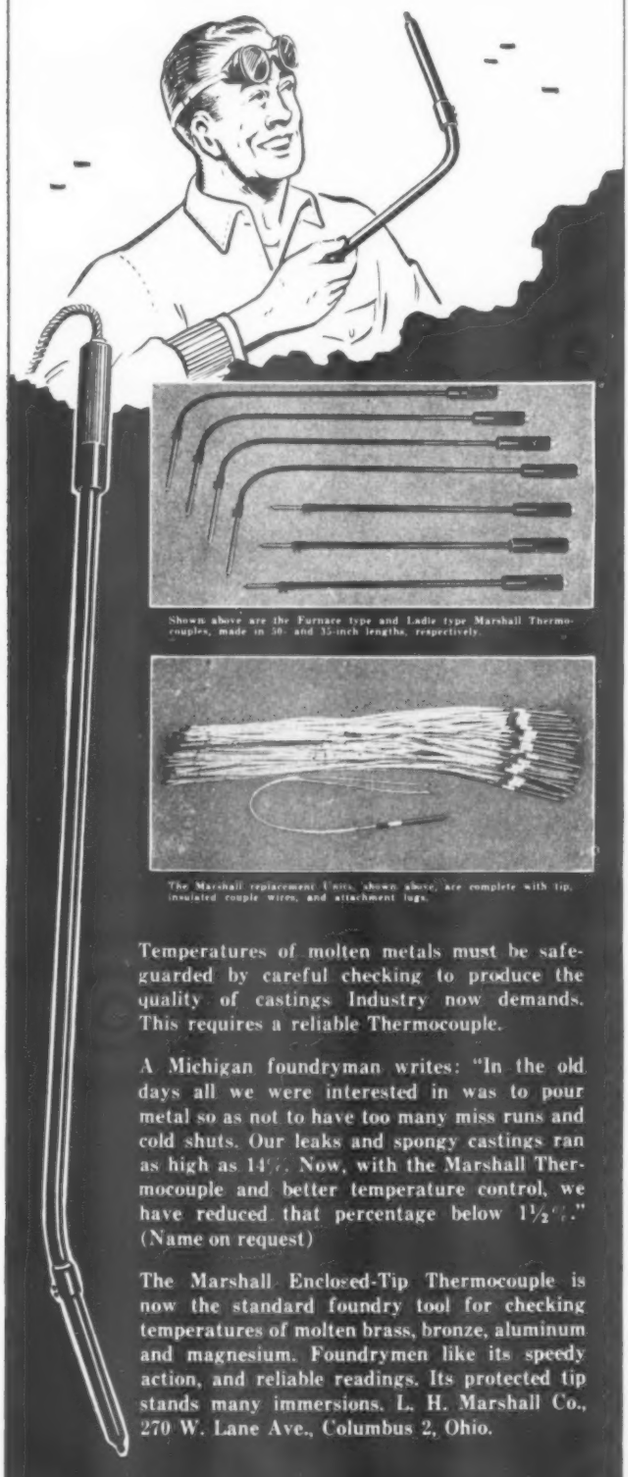
"IT *SAFEGUARDS* our temperatures!"



Shown above are the Furnace type and Ladle type Marshall Thermocouples, made in 36- and 35-inch lengths, respectively.

The Marshall replacement Units, shown above, are complete with tip, insulated couple wires, and attachment lugs.

Temperatures of molten metals must be safeguarded by careful checking to produce the quality of castings Industry now demands. This requires a reliable Thermocouple.

A Michigan foundryman writes: "In the old days all we were interested in was to pour metal so as not to have too many miss runs and cold shuts. Our leaks and spongy castings ran as high as 14%. Now, with the Marshall Thermocouple and better temperature control, we have reduced that percentage below 1½%." (Name on request)

The Marshall Enclosed-Tip Thermocouple is now the standard foundry tool for checking temperatures of molten brass, bronze, aluminum and magnesium. Foundrymen like its speedy action, and reliable readings. Its protected tip stands many immersions. L. H. Marshall Co., 270 W. Lane Ave., Columbus 2, Ohio.

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You can give the new and more potent Castflux a trial on the basis of our unconditional guarantee. Send us a minimum order of 200 pounds.

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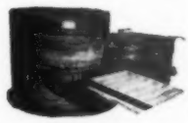
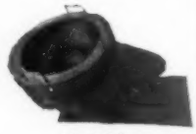

Model AS


Model J

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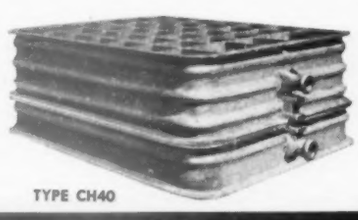

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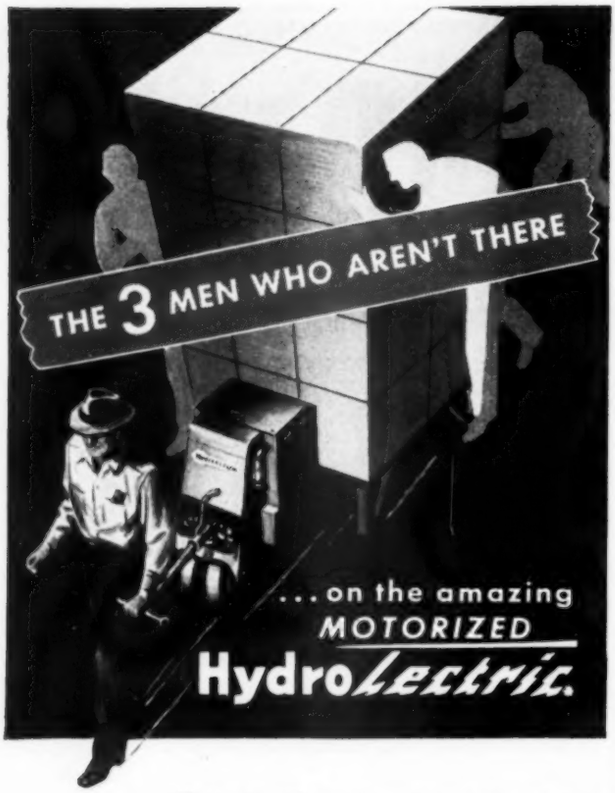

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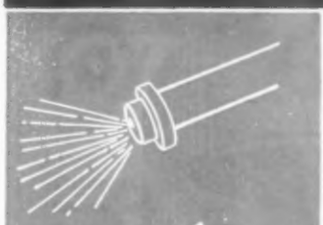

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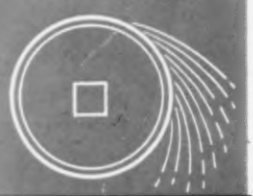

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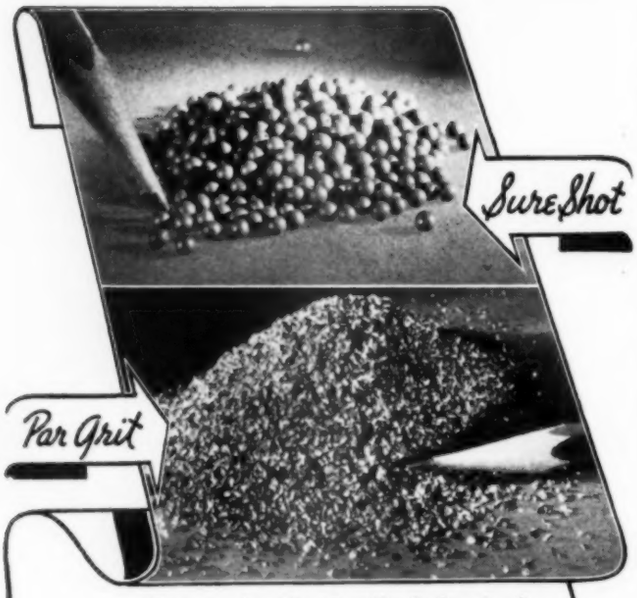

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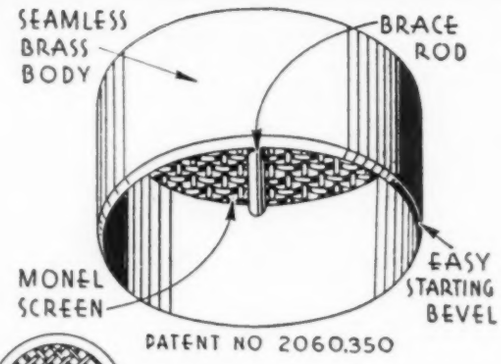

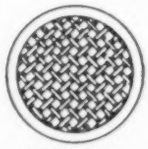
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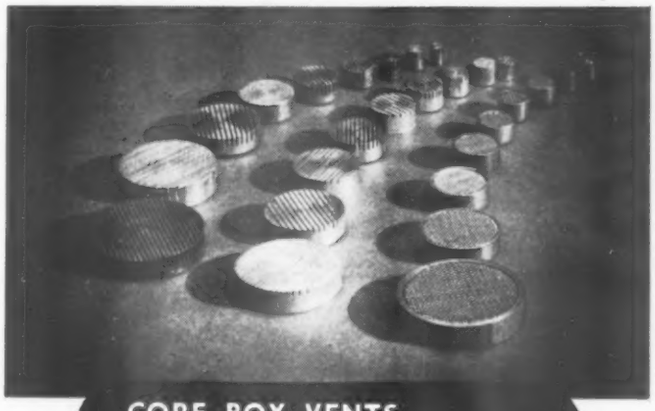

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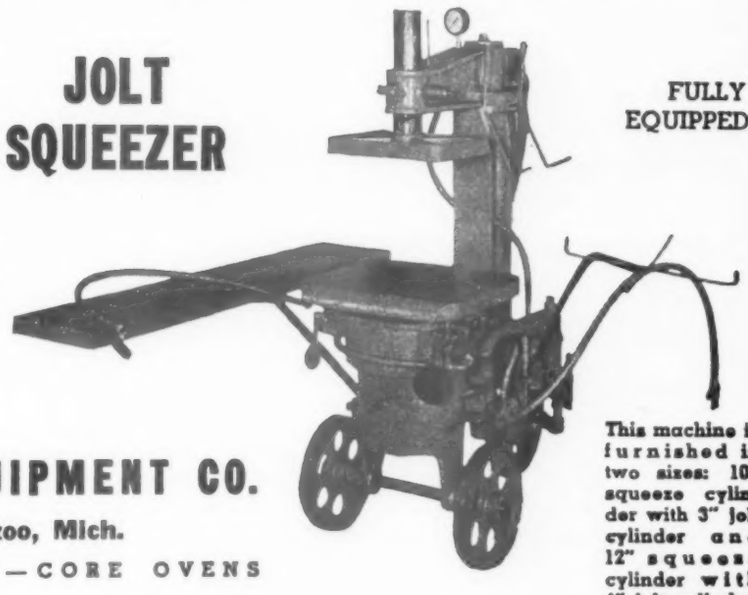

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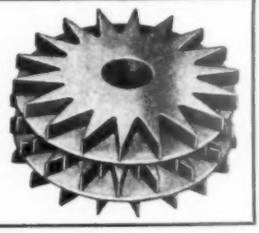

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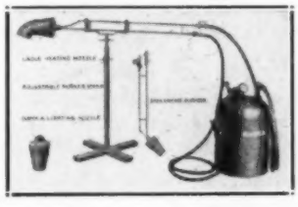

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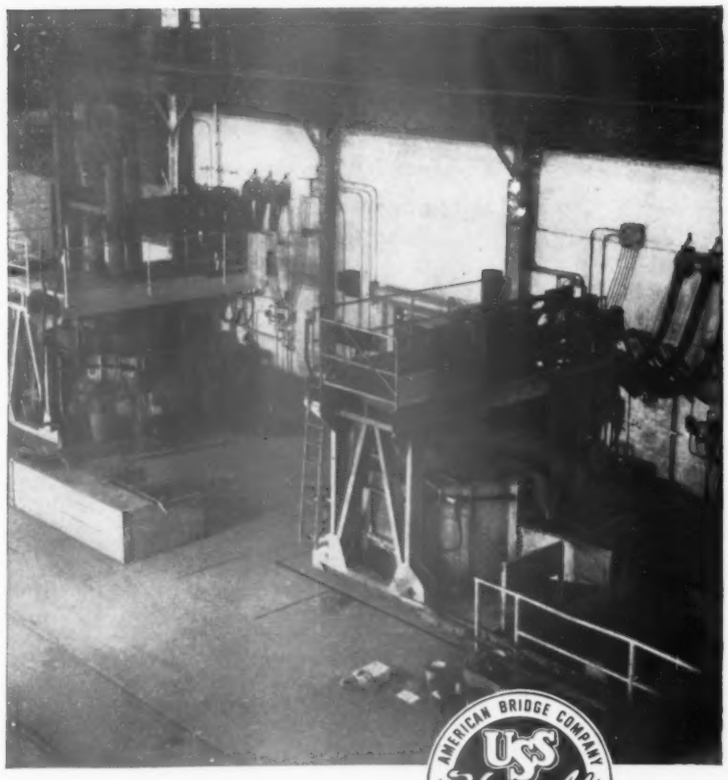

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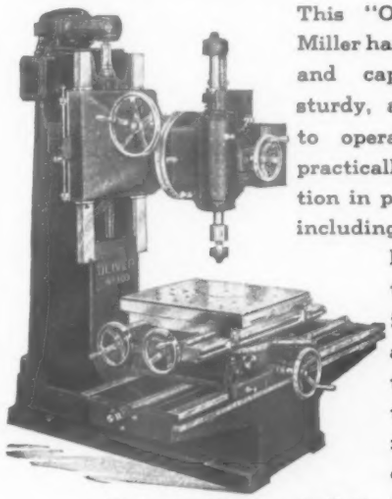

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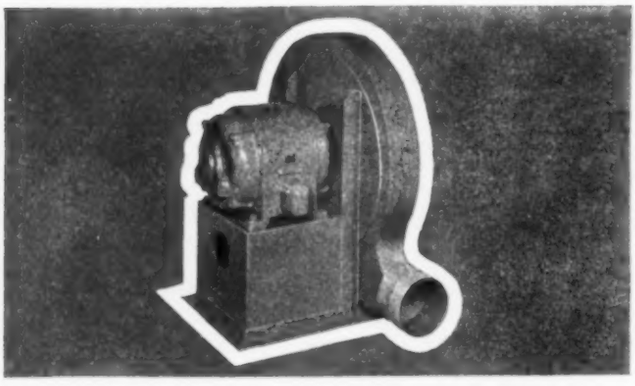

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Houghton Co., E. F., Philadelphia, Pa.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia 24, Pa.
Werner G. Smith Co., 2191 W. 110th St., Cleveland 2, O.
Frederic B. Stevens, Inc., Detroit 26, Mich.
United Oil Mfg. Co., 1429 Walnut St., Erie, Pa.
Velsicol Corp., 120 E. Pearson St., Chicago 11, Ill.

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National Carbon Co. Inc., Carbon Products Div., 30 E. 42nd St., New York 17, N. Y. Oakland 8, California.
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Pittsburgh Metals Purifying Co., 1352 Marvista St., Pittsburgh 12, Pa.
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American Air Filter Co., 266 Central Ave., Louisville 8, Ky.

FIRE BRICK

Babcock & Wilcox, 85 Liberty St., New York 6, N. Y.
Carborundum Co., Perth Amboy, N. J.
Chicago Retort & Firebrick Co., 208 So. LaSalle St., Chicago 4, Ill.
Electro Refractories & Alloys Corp., Vars Bldg., Buffalo 2, N. Y.
Illinois Clay Products Co., Joliet, Ill.
Ironton Fire Brick Co., Ironton, O.
Norton Co., Worcester 6, Mass.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia 24, Pa.

FIRE BRICK (Cont'd.)

Stevens Inc., Frederic B., Detroit 26, Mich.
Chas. Taylor Sons Co., P. O. Box 58, Cincinnati, Ohio

FIRE CLAY

Eastern Clay Products, Inc., Elfort, O.
Illinois Clay Products Co., Joliet, Ill.
Ironton Fire Brick Co., Ironton, O.
Chas. Taylor Sons Co., P. O. Box 58, Cincinnati, Ohio

FIRE SAND

Carborundum Co., Niagara Falls, N. Y.
Cleveland Quarries Co., Guildhall Bldg., Cleveland 15, O.

FIRESTONE

Cleveland Quarries Co., Guildhall Bldg., Cleveland 15, O.

FLASK BANDS

Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.

FLASKS (Aluminum)

Adams Co., Dubuque, Iowa
Fremont Flask Co., Fremont, O.
Hines Flask Co., 1324 Hird Ave., Cleveland 7, O.

FLASKS (Dowmetal)

Fremont Flask Co., Fremont, O.
Hines Flask Co., 1324 Hird Ave., Cleveland 7, O.

FLASK FILLERS

Bartlett & Snow, C. O., Co., 6201 Harvard Ave.,
Jeffrey Mfg. Co., 907-99 N. Fourth St., Columbus 16, O.

FLASKS (Slip)

Adams Co., Dubuque, Iowa
Fremont Flask Co., Fremont, O.
Freeman Supply Co., Toledo 5, O.
Hines Flask Co., 1324 Hird Ave., Cleveland 7, O.
Industrial Fabricating, Inc., 817 Hall St., Eaton Rapids, Mich.

FLASKS (Snap)

Adams Co., Dubuque, Iowa
Arcade Manufacturing Div. Rockwell Mfg. Co., Freeport, Ill.
Diamond Clamp & Flask Co., Richmond, Ind.
Fremont Flask Co., Fremont, O.
Hines Flask Co., 1324 Hird Ave., Cleveland 7, O.
Stevens, Inc., Frederic B., Detroit 26, Mich.

FLASKS (Steel)

Industrial Fabricating, Inc., 817 Hall St., Eaton Rapids, Mich.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee 14, Wis.
Truscon Steel Co., Youngstown 1, O.

FLASK FITTINGS

Buckeye Products Co., 7022 Vine St., Cincinnati 16, Ohio
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland 5, O.
Hines Flask Co., 1324 Hird Ave., Cleveland 7, O.
Truscon Steel Co., Youngstown 1, O.

FLASK LUMBER

Dougherty Lumber Co., 4300 E. 66th St., Cleveland 5, O.

FLASKS (Wood)

Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.

FLEXIBLE SHAFT MACHINERY

Mall Tool Co., 7720 South Chicago Ave., Chicago 19, Ill.
Strand Co., N. A., 5001 N. Wolcott Ave., Chicago 40, Ill.
Wyzenbeek & Staff Inc., 838 W. Hubbard St., Chicago, Ill.

FLOORING (Non-Slip)

Norton Co., Worcester 6, Mass.

FLUXES

American British Chemical Inc., 180 Madison Ave., New York 16.
Cleveland Flux Co., 1026 Main St., Cleveland 13, O.
Dockson Corp., 2832 E. Grand Blvd., Detroit 11, Mich.
Mathieson Alkali Works, Inc., 60 E. 42nd St., New York 17, N. Y.
National Pigment Co., East York St., Philadelphia, Pa.
Niagara Falls Smelting & Refining Corp., 2204 Elmwood Ave., Buffalo 17, N. Y.
Pittsburgh Metals Purifying Co., 1352 Marvista St., Pittsburgh 12, Pa.

FOUNDRY LAYOUT & METHODS

Associated Engineers Inc., 230 E. Berry St., Fort Wayne 2, Ind.
Lester B. Knight & Associates, 120 So. LaSalle St., Chicago 3, Ill.

FOUNDRY NAILS

Capewell Mfg. Co., Hartford, Conn.
Standard Horse Nail Corp., New Brighton, Pa.

FOUNDRY SHOVELS
(See SHOVELS)

FOUNDRY SUPPLY HOUSES

Buckeye Products Co., 7022 Vine St., Cincinnati 16, Ohio.
Combined Supply & Equipment Co., Inc., 215 Chandler St., Buffalo 7, N. Y.
Eastern Clay Products, Inc., Elfort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland 5, O.
Freeman Supply Co., 1152 E. Broadway, Toledo 5, O.
Hoffman Foundry Supply Co., 1193 Main St., Cleveland, Ohio.
Midwest Foundry Supply Co., Edwardsville, Ill.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia 24, Pa.
Stevens, Inc., Frederic B., Detroit 26, Mich.

FURNACES (Aluminum & Magnesium Billets)

Carl-Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio.
Despatch Oven Co., Minneapolis 14, Minn.
Electric Furnace Co., W. Wilson St., Salem, Ohio.
Loftus Engineering Co., 610 Smithfield St., Pittsburgh 22, Pa.
W. S. Rockwell Co., 56 Church St., New York 7, N. Y.

FURNACES (Aluminum & Magnesium Forgings)

Carl-Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio.
Despatch Oven Co., Minneapolis 14, Minn.
Electric Furnace Co., W. Wilson St., Salem, Ohio.
Kirk Blum Mfg. Co., 2838 Spring Grove Ave., Cincinnati 25, O.
W. S. Rockwell Co., 56 Church St., New York 17, N. Y.

FURNACES (Aluminum Melting)

Ajax Engineering Corp., Trenton, N. J.
Campbell-Hausfeld Co., Harrison, O.
Eclipse Fuel Engineering Co., 711 So. Main St., Rockford, Ill.
Romph Furnace Co., 7849 Hartwell, Dearborn, Mich.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.

FURNACES (Aluminum Rivet Heating)

Ajax Electric Co., Inc., Philadelphia 23, Pa.
Despatch Oven Co., Minneapolis 14, Minn.

FURNACES (Annealing)

Bellevue Industrial Furnace Co., 2975 Bellevue Ave., Detroit 7, Mich.
Campbell-Hausfeld Co., Harrison, Ohio.
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio

FURNACES (Annealing) (Cont'd.)

Despatch Oven Co., Minneapolis 14, Minn.
Eclipse Fuel Engineering Co., 711 So. Main St., Rockford, Ill.
Electric Furnace Co., W. Wilson St., Salem, Ohio.
Gehnrich Oven Div., W. S. Rockwell Co., 56 Church St., New York 7, N. Y.
Johnston Mfg. Co., Minneapolis 13, Minn.
Lindberg Engineering Co., 2448 West Hubbard, Chicago 12, Ill.
Loftus Engineering Co., 610 Smithfield St., Pittsburgh 22, Pa.
W. S. Rockwell Co., 56 Church St., New York 7, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Crucible Melting)

Ajax Electrothermic Corp., Trenton, N. J.
Ajax Metal Co., Philadelphia 23, Pa.
Campbell-Hausfeld Co., 300-320 Moore St., Harrison, O.
Eclipse Fuel Engrg. Co., 711 So. Main St., Rockford, Ill.
Fen Machine Co., 1350 Babbitt Rd., Cleveland 17, Ohio.
Fisher Furnace Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Johnston Mfg. Co., Minneapolis 13, Minn.
Radiant Combustion Inc. Warren, Ohio.
W. S. Rockwell Co., 56 Church St., New York 7, N. Y.
Stroman Furnace & Engineering Co., 300 W. Adams St., Chicago 6, Ill.

FURNACES (Electric Melting)

Ajax Electrothermic Corp., Trenton, N. J.
Ajax Engineering Corp., Trenton, N. J.
Ajax Metal Co., Philadelphia 23, Pa.
American Bridge Co., Pittsburgh 19, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Swindell-Dressler Corp., Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Gas or Oil Fired)

Bellevue Industrial Furnace Co., 2975 Bellevue Ave., Detroit 7, Mich.
Campbell-Hausfeld Co., Harrison, O.
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio
Electric Furnace Co., W. Wilson St., Salem, Ohio.
Fen Machine Co., 1350 Babbitt Rd., Cleveland 17, Ohio.
Fisher Furnace Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Haynes Foundry Equipment Co., 1734 Lake St., Kalamazoo 21, Mich.
Johnston Mfg. Co., Minneapolis 13, Minn.
Lindberg Engineering Co., 2448 West Hubbard, Chicago 12, Ill.
Loftus Engineering Co., 610 Smithfield St., Pittsburgh 22, Pa.
Radiant Combustion Inc., Warren, Ohio.
W. S. Rockwell Co., 56 Church St., New York 7, N. Y.
Romph Furnace Co., 7849 Hartwell, Dearborn, Mich.
Stroman Furnace & Engineering Co., 300 W. Adams St., Chicago 6, Ill.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.

FURNACES (Gray Iron Melting)

American Bridge Co., Pittsburgh 19, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Swindell-Dressler Corp., Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Heat Treating)

Ajax Electric Co., Inc., Philadelphia 23, Pa
Bellevue Industrial Furnace Co., 2975 Bellevue Ave., Detroit 7, Mich.

FURNACES (Heat Treating) (Cont'd.)

Carl-Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio
Despatch Oven Co., Minneapolis 14, Minn.
Eclipse Fuel Engineering Co., 711 So. Main St., Rockford, Ill.
Electric Furnace Co., W. Wilson St., Salem, Ohio.
Johnston Mfg. Co. Minneapolis 13, Minn.
Lanly Company, 750 Prospect Ave., Cleveland 15, Ohio.
Lindberg Engineering Co., 2448 West Hubbard, Chicago 12, Ill.
Loftus Engineering Co., 610 Smithfield St., Pittsburgh 22, Pa.
Maehler, Paul, Co., 2200 W. Lake St., Chicago 12, Ill.
Radiant Combustion Inc., Warren, Ohio.
W. S. Rockwell Co., 56 Church St., New York 7, N. Y.

FURNACES, HEAT TREATING (Electric)

Ajax Electric Co., Inc., Philadelphia 23, Pa.
Ajax Electrothermic Corp., Trenton, N. J.
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio
Despatch Oven Co., Minneapolis 14, Minn.
Electric Furnace Co., W. Wilson St., Salem, Ohio.
Lindberg Engineering Co., 2448 West Hubbard, Chicago 12, Ill.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

FURNACES (Malleable Annealing)

Carl-Mayer Corp., 3030 Euclid Ave., Cleveland 15, Ohio.
Electric Furnace Co., W. Wilson St., Salem, Ohio.
General Electric Co., Schenectady, N. Y.
Lindberg Engineering Co., 2448 West Hubbard, Chicago 12, Ill.
W. S. Rockwell Co., 56 Church St., New York 7, N. Y.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.
Young Brothers Co., 6508 Mack Ave., Detroit 7, Mich.

FURNACES (Malleable Melting)

American Bridge Co., Pittsburgh 19, Pa.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Nonferrous Melting)

Ajax Electrothermic Corp., Trenton, N. J.
Ajax Engineering Corp., Trenton, N. J.
Ajax Metal Co., Philadelphia 23, Pa.
Bellevue Industrial Furnace Co., 2975 Bellevue Ave., Detroit 7, Mich.
Campbell-Hausfeld Co., 300-320 Moore St., Harrison, O.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Eclipse Fuel Engineering Co., 711 So. Main St., Rockford, Ill.
Fen Machine Co., 1350 Babbitt Rd., Cleveland 17, Ohio.
Fisher Furnace Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Haynes Foundry Equipment Co., 1734 Lake St., Kalamazoo 21, Mich.
Johnston Mfg. Co., Minneapolis 13, Minn.
Kindt-Collins Co., 12653 Elmwood Ave., Cleveland 11, Ohio.
W. S. Rockwell Co., 56 Church St., New York 7, N. Y.
Romph Furnace Co., 7849 Hartwell, Dearborn, Mich.
Stroman Furnace & Engineering Co., 300 W. Adams St., Chicago 6, Ill.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
Swindell-Dressler Corp., Pittsburgh, Pa.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Powdered Coal)

Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Steel Melting)

Ajax Electrothermic Corp., Trenton, N. J.
American Bridge Co., Pittsburgh 19, Pa.

FURNACES (Steel Melting) (Cont'd.)

Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Swindell-Dressler Corp., Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACE BLOWERS

Campbell-Hausfeld Co., Harrison, O.
Eclipse Fuel Engineering Co., 711 So. Main St., Rockford, Ill.
Fisher Furnace Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Roots-Connersville Blower Corp., Connersville, Ind.

FURNACE BOTTOMS

Industrial Silica Corp., 602 Stambaugh Bldg., Youngstown, Ohio

FURNACE LININGS

Campbell-Hausfeld Co., Harrison, O.
Carborundum Co., Perth Amboy, N. J.
Electro Refractories & Alloys Corp., Vars Bldg., Buffalo 2, N. Y.
Fisher Furnace Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Ironton Fire Brick Co., Ironton, O.
National Carbon Co. Inc., Carbon Products Div., 30 E. 42nd St., New York 17, N. Y.
Nock and Sons Co., 1243 East 55th St., Cleveland 14, Ohio
Ramtite Co., 1803 S. Rockwell St., Chicago 8, Ill.
Stroman Furnace & Engineering Co., 300 W. Adams St., Chicago 6, Ill.
United States Graphite Co., Saginaw, Mich.

GAGES

Acme Aluminum Alloys Co. Inc., 232 N. Findlay St., Dayton 3, O.

GAGGERS

Federal Foundry Supply Co., 4600 E. 71st., Cleveland 5, O.

GAS

American Gas Association, 420 Lexington Ave., New York 17, N. Y.

GAS (Oxygen, Acetylene, Industrial)

Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y.
Liquid Carbonic Corp., 3110 S. Kedzie Ave., Chicago 23, Ill.

GAS BURNERS

Eclipse Fuel Engineering Co., 711 So. Main St., Rockford, Ill.
Elematic Equipment Corp., 6046 S. Wentworth Ave., Chicago 21, Ill.
Fisher Furnace Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
North American Mfg. Co., 2910 E. 75th St., Cleveland 4, O.

GLOVES (Industrial, Safety)

American Optical Co., Southbridge, Mass.
Safety Clothing & Equipment Co., 7016 Euclid Ave., Cleveland, Ohio

GOGGLES and EYE PROTECTORS

American Optical Co., Southbridge, Mass.
Chicago Eye Shield Co., 2300 West Warren, Chicago 12, Ill.
Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.
Willson Products Inc., Reading, Pa.

GRAPHITE

Asbury Graphite Mills, Asbury, N. J.
Bloomsbury Graphite Co., Bloomsbury, N. J.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland 5, O.
International Graphite & Electrode Corp., St. Marys, Pa.
National Carbon Co. Inc., Carbon Products Div., 30 E. 42nd St., New York 17.
United States Graphite Co., Saginaw, Mich.

GRINDERS (Electric Portable)

Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York 17, N. Y.
Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago 6, Ill.
U. S. Electrical Tool Co., Cincinnati 4, O.

GRINDERS (Flexible Shaft)

Mall Tool Co., 7720 South Chicago Ave., Chicago 19, Ill.
N. A. Strand Co., 5001 N. Wolcott Ave., Chicago 40, Ill.

GRINDERS (Pneumatic Portable)

Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York 17.
Cleveland Pneumatic Tool Co., 3781 E. 77th St., Cleveland 5, Ohio
Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago 6, Ill.
Keller Tool Co., Grand Haven, Mich.

GRINDERS (Surface, Bench, Disc, Floor)

Fox Grinders, Inc., Oliver Bldg., Pittsburgh 22, Pa.
Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago 6, Ill.
Kindt-Collins Co., 12653 Elmwood Ave., Cleveland 11, O.
Mall Tool Co., 7720 South Chicago Ave., Chicago 19, Ill.
Safety Grinding Wheel & Mach. Co., Springfield, O.
N. A. Strand Co., 5001 N. Wolcott Ave., Chicago 40, Ill.
U. S. Electrical Tool Co., Cincinnati 4, O.

GRINDERS (Swing Frame)

Fox Grinders, Inc., Oliver Bldg., Pittsburgh 22, Pa.
Mall Tool Co., 7720 South Chicago Ave., Chicago 19, Ill.
Safety Grinding Wheel & Mach. Co., Springfield, O.

GRINDING WHEELS—See ABRASIVE WHEELS

GRINDING WHEEL DRESSERS

Carborundum Co., Niagara Falls, N. Y.
Desmond-Stephan Mfg. Co., Urbana, O.
Simonds Worden White Co., Dayton 7, O.
Western Tool & Mfg. Co., Springfield, O.

GRINDSTONES

Bay State Abrasive Products Co., Westboro, Mass.
Sterling Grinding Wheel Div. Cleveland Quarries Co.,

GRIT (Abrasive)

Alloy Metal Abrasive Co., Ann Arbor, Mich.
American Steel Abrasives Co., Galion, O.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Carborundum Co., Niagara Falls, N. Y.
Cleveland Metal Abrasive Co., 887 E. 67th St., Cleveland, Ohio.
Globe Steel Abrasive Co., Mansfield, O.
Hickman - Williams & Co., Union Commerce Bldg., Cleveland 14, O.
Pangborn Corp., Hagerstown, Md.
Pittsburgh Crushed Steel Co., Pittsburgh 1, Pa.
Simonds Worden White Co., Dayton 7, O.
Western Metal Abrasive Co., 2545 East 79th St., Cleveland 4, O.

GYPSUM CEMENT

United States Gypsum Co., 300 W. Adams St., Chicago, Ill.

HAMMERS (Chipping)

Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.

HAMMERS (Chipping) (Cont'd.)

Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York 17.
Cleveland Pneumatic Tool Co., 3781 E. 77th St., Cleveland 5, Ohio
Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago 6, Ill.
Keller Tool Company, Grand Haven, Mich.
Schramm Inc., West Chester, Pa.

HARDNESS TESTING EQUIPMENT

Harry W. Dietert Co., 9330A Roselawn Ave., Detroit 4, Mich.

HEAT CONTROL AND RECORDING DEVICES

Elematic Equipment Corp., 6046 S. Wentworth Ave., Chicago 21, Ill.
Foxboro Company, Foxboro, Mass.
Illinois Testing Laboratories, 418 N. LaSalle St., Chicago 10, Ill.
Lindberg Engineering Co., 2448 West Hubbard, Chicago 12, Ill.
Marshall Co., L. H., 270 W. Lane, Columbus 1, O.

HEATERS (Direct Fired)

Despatch Oven Co., Minneapolis 14, Minn.
Lanly Co., 750 Prospect Ave., Cleveland 15, Ohio.

HEATERS (Gas, Oil, Electric)

American Foundry Equipment Co., Mishawaka, Ind.
Despatch Oven Co., Minneapolis 14, Minn.
Gehnrich Oven Div., W. S. Rockwell Co., 56 Church St., New York 7, N. Y.
Lanly Co., 750 Prospect Ave., Cleveland 15, Ohio.

HEATERS (High Frequency Electric)

Ajax Electrothermic Corp., Trenton, N. J.

HEATERS (Indirect Fired)

Despatch Oven Co., Minneapolis 14, Minn.

HEATERS (Liquid, Steam)

Johnson Corporation, Three Rivers, Mich.

HEATERS (Space, Unit, Oven, Water)

American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Maehler, Paul Co., 2200 W. Lake St., Chicago 12, Ill.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.

HELMETS (Blasting)

American Foundry Equipment Co., 505 Byrkit St., Mishawaka, Ind.
American Optical Co., Southbridge, Mass.
Mine Safety Appliance Co., Braddock, Thomas & Meade Sts., Pittsburgh 8, Pa.
Pangborn Corp., Hagerstown, Md.
Safety Clothing & Equipment Co., 7016 Euclid Ave., Cleveland, Ohio
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland 2, O.

HELMETS (Welding)

American Optical Co., Southbridge, Mass.

HOISTS (Air)

Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York 17.
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis 20, Mo.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago 6, Ill.
Keller Tool Company, Grand Haven, Mich.

HOISTS (Chain)

Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Reading Chain & Block Corp., 2108 Adams St., Reading, Pa.
Wright Mfg. Div., American Chain & Cable Co., York, Pa.

HOISTS (Electric)

Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Port Washington, Wis.
Reading Chain & Block Corp., 2108 Adams St., Reading, Pa.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.
Wright Mfg. Div., American Chain & Cable Co., York, Pa.

HOISTS (Hand)

Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Clipper Mfg. Co., 4030 Manchester, St. Louis, Mo.

HOSE (Air, Blasting, Water, Gas)

Cleveland Pneumatic Tool Co., 3781 E. 77th St., Cleveland 5, Ohio
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago 6, Ill.
Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Manhattan Rubber Mfg. Div. of Raybestos, Manhattan, Inc., 77 Townsend St., Passaic, N. J.
Pangborn Corp., Hagerstown, Md.
Schramm Inc., West Chester, Pa.

HYDRAULIC CLEANING EQUIPMENT

Hydro-Blast Corp., 2550 N. Western Ave., Chicago 47, Ill.
Pangborn Corp., Hagerstown, Md.
N. Ransohoff, Inc., 208 W. 71st St., Cincinnati 16, O.

ILLUMINATORS (X-Ray Film)

Eastman Kodak Co., Rochester, N. Y.

IMPREGNATING SYSTEMS

Empire Varnish Co., 2636 E. 76th St., Cleveland 4, O.
Kerkling & Co., Burbank, Calif.

INGOT MOLDS

Acme Foundry Co., Detroit 16, Mich.

INGOTS (Magnesium)

Dow Chemical Co., Midland, Mich.

INGOTS (Nonferrous)

Ajax Metal Co., Philadelphia 23, Pa.
Aluminum Company of America, Pittsburgh, Pa.
Aluminum & Magnesium Inc., Sandusky, O.
American Smelting & Refining Co., 120 Broadway, New York 5.
Apex Smelting Co., Chicago, Ill.
Cleveland Electro Metals Co., W. 38th St. & NP RR. Cleveland 13, O.
Federated Metals Div., American Smelting & Ref. Co., New York 5.
General Smelting Co., Philadelphia, Pa.
International Nickel Co., Inc., 67 Wall St., New York City 5.
Jobbins, Wm. F., Inc., Aurora, Ill.
Lavin & Sons R., Inc., Chicago, Ill.
National Smelting Co., Cleveland, O.
Niagara Falls Smelting & Refining Corp., 2204 Elmwood Ave., Buffalo 17, New York.
I. Schumann & Co., 3027 E. 55th St., Cleveland, Ohio
Silverstein & Pinsof, Inc., 1720 N. Elston, Chicago 22, Ill.
Sonken-Galamba Corp., Kansas City, Kan.
U. S. Metals Refining Co., New York.
U. S. Reduction Co., E. Chicago, Ind.
Western Metal Co., 3201 S. Kedzie Ave., Chicago 23, Ill.

INSPECTION (Cast Metals)

Magnaflux Corporation, 5910 Northwest Highway, Chicago 31, Ill.

INSPECTION (Fluorescent Penetrant)

Magnaflux Corporation, 5910 Northwest Highway, Chicago 31, Ill.

INSPECTION (Magnetic Particle)

Magnaflux Corporation, 5910 Northwest Highway, Chicago 31, Ill.

INSUATORS (for casting heads)

Houghton Co., E. F., Philadelphia, Pa.

IRON CEMENT

Smooth-On Mfg. Co., 570 Communipaw Ave., Jersey City 4, N. J.

IRON ORE

Bethlehem Steel Co., Bethlehem, Pa.
Pickands, Mather & Co., Cleveland 14, O.

IRON OXIDES

Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.
Delta Oil Products Co., Milwaukee 9, Wis.

JACKETS (Mold)

Adams Co., Dubuque, Iowa
Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.
Freeman Supply Co., 1152 Broadway, Toledo 5, O.
Fremont Flask Co., Fremont, O.
Hines Flask Co., 1324 Hird Ave., Cleveland 7, O.
Industrial Fabricating, Inc., 817 Hall St., Eaton Rapids, Mich.

LABORATORY EQUIPMENT (Chemical)

Buehler, Ltd., 228 N. LaSalle St., Chicago 1, Ill.
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit 4, Mich.
Laboratory Equipment Corp., Benton Harbor, Mich.

LABORATORY EQUIPMENT (Physical)

Buehler, Ltd., 228 N. LaSalle St., Chicago 1, Ill.
Elematic Equipment Corp., 6046 S. Wentworth Ave., Chicago 21, Ill.
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit 4, Mich.
Laboratory Equipment Corp., Benton Harbor, Mich.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Norton Co., Worcester 6, Mass.

LADLES

Bethlehem Steel Co., Bethlehem, Pa.
Haynes Foundry Equipment Co., 1734 Lake St., Kalamazoo 21, Mich.
Industrial Equipment Co., Minster, O.
Modern Equipment Co., Port Washington, Wis.
Frederic B. Stevens, Inc., Detroit 26, Mich.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

LADLE HEATERS

Hauck Mfg. Co., 106 Tenth St., Brooklyn 15, N. Y.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

LADLE LININGS

Chicago Retort & Firebrick Co., 208 So. LaSalle St., Chicago 4, Ill.
Ironton Fire Brick Co., Ironton, Ohio.
Nock and Sons Co., 1243 East 55th St., Cleveland 14, Ohio

LATHE CENTERS

Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.

LEAD

American Smelting & Refining Co., 120 Broadway, New York 5.

LEGGINGS (Safety)

Safety Clothing & Equipment Co., 7016 Euclid Ave., Cleveland, Ohio

LIMESTONE

Bethlehem Steel Co., Bethlehem, Pa.

LINSEED OIL

Hercules Powder Co., 999 Market St., Wilmington 99, Del.

LOADERS

Clearfield Machine Co., Clearfield, Pa.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.

LUBRINCANTS (Industrial)

Houghton Co., E. F., Philadelphia, Pa.
United States Graphite Co., Saginaw, Mich.

LUMBER (All kinds)

Dougherty Lumber Co., 4300 East 68th St., Cleveland 5, O.

MACHINE KEYS

Standard Hires Nail Corp., New Brighton, Pa.

MAGNESIUM (Ingots)

Apex Smelting Co., 2534 Fillmore St., Chicago 12, Ill.
Dow Chemical Co., Midland, Mich.

MAGNET CONTROLLERS

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Clearfield Machine Co., Clearfield, Pa.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Coaltoter Conveyor Co., 310 So. Michigan, Chicago 4, Ill.
Jeffrey Mfg. Co., 907-99 N. Fourth St., Columbus 16, O.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, O.
Penn Iron Works, Reading, Pa.
Royer Foundry & Machine Co., Kingston, Pa.

SAND CONVEYING and HANDLING EQUIPMENT (Pneumatic)

Ajax Flexible Coupling Co., Westfield, N. Y.
Clark Tructractor Div. of Clark Equipment Co., Battle Creek, Mich.
Fuller Company, Catasaqua, Pa.
Frank G. Hough Co., Libertyville, Ill.
Robins Conveyors Inc., Passaic, N. J

SAND DRYERS

Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis.
Bartlett & Snow Co., C. O., 6201 Harvard Ave., Cleveland 5, O.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.

SAND ENGINEERING SERVICE

Minco Products Corp., Saginaw, Mich.

SANDING MACHINERY

Delta Mfg. Co., Industrial Division, 620 E. Vienna Ave., Milwaukee 1, Wis.
Oliver Machinery Company, Grand Rapids 2, Mich.

SAND MEASURING and WEIGHING DEVICES

Baker Perkins Inc., Saginaw, Mich.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.

SAND MIXERS

American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Baker Perkins Inc., Saginaw, Mich.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago 39, Ill.
Blystone Division Standard Sand & Machine Co., 549 W. Washington Blvd., Chicago 6, Ill.
Clearfield Machine Co., Clearfield, Pa.
Construction Machinery Corp., Waterloo, Iowa.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

SAND PREPARATION EQUIPMENT

Ajax Flexible Coupling Co., Westfield, N. Y.
Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Baker Perkins Inc., Saginaw, Mich.
Bartlett & Snow Co., C. O., 6201 Harvard Ave., Cleveland 5, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago 39, Ill.
Clearfield Machine Co., Clearfield, Pa.
Grimes Molding Machine Co., 1429 Virginia Park, Detroit 6, Mich.
Hydro-Blast Corp., 2550 N. Western Ave., Chicago 47, Ill.
Jeffrey Mfg. Co., 907-99 N. Fourth St., Columbus 16, O.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, O.
Purity Moulding Sand Co., Dallas City, Ill.
Royer Foundry & Machine Co., Kingston, Pa.
Screen Equipment Co., Buffalo, N. Y.
Simplicity Engineering Co., Durand, Mich.

SAND RAMMERS

Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York 17, N. Y.
Cleveland Pneumatic Tool Co., 3781 E. 77th St., Cleveland 5, Ohio
Dayton Pneumatic Tool Co., Dayton 1, O.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh 22, Pa.
Keller Tool Co., Grand Haven, Mich.

SAND RECLAIMERS

Hydro-Blast Corp., 2550 N. Western Ave., Chicago 47, Ill.
Jeffrey Mfg. Co., 907 N. Fourth St., Columbus 16, O.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Nichols Engineering & Research Corp., 60 Wall Tower, New York 5, N. Y.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee 4, Wis.

SAND SIFTING and SCREENING MACHINERY

Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis.
American Air Filter Co., 266 Central Ave., Louisville 8, Ky.
Bartlett & Snow, C. O., Co., 6201 Harvard Ave., Cleveland 5, Ohio
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago 8, Ill.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland 5, O.
Foundry Supplies & Mfg. Co., 2221 Orchard St., Chicago 14, Ill.
Great Western Mfg. Co., Leavenworth, Kansas.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Royer Foundry & Machine Co., Kingston, Pa.
Screen Equipment Co., Buffalo, N. Y.
Simplicity Engineering Co., Durand, Mich.
Pangborn Corp., Hagerstown, Md.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

SAND STORAGE BINS & GATES

Bartlett & Snow, C. O., Co., 6201 Harvard Ave., Cleveland 5, Ohio
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago 39, Ill.
Jeffrey Mfg. Co., 907 N. Fourth St., Columbus 16, O.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Neff & Fry Co., Camden, O.

SAWS (Band, Metal, Wood)

Oliver Machinery Company, Grand Rapids 2, Mich.

SAWS (Cold Metal)

Bethlehem Steel Co., Bethlehem, Pa.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia 35, Pa.

SAWS (Masonry)

Clipper Mfg. Co., 4030 Manchester, St. Louis, Mo.

SCALING HAMMERS

Dayton Pneumatic Tool Co., Dayton 1, O.
Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago 6, Ill.
Keller Tool Company, Grand Haven, Mich.
Schramm, Inc., West Chester, Pa.

SCREENS (Shake-Out)

Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland 5, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago 39, Ill.
Jeffrey Mfg. Co., 907 N. Fourth St., Columbus 16, O.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Screen Equipment Co., Buffalo, N. Y.
Simplicity Engineering Co., Durand, Mich.

SCREENS (Vibrating)

Ajax Flexible Coupling Co., Westfield, N. Y.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
Robins Conveyors, Inc., Passaic, N. J.
Screen Equipment Co., Buffalo, N. Y.

SEA COAL

Federal Foundry Supply Co., 4600 E. 71st St., Cleveland 5, O.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland 13, O.
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Kerkling & Co., Burbank, Calif.

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American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.

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American Air Filter Co., 266 Central Ave., Louisville 8, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Chicago Mfg. & Distributing Co., 1928 W. 46th St., Chicago 9, Ill.
Johnson Corporation, Three Rivers, Mich.
Jas. A. Murphy & Co., Hamilton, O.
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SEPARATORS (Magnetic)

Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago 39, Ill.
Dings Magnetic Mfg. Co., E. Smith St., Milwaukee 7, Wis.
National Engineering Co., 549 W. Washington St., Chicago 6, Ill.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee 4, Wis.

SHAKE-OUT MACHINERY

Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis.
American Air Filter Co., 266 Central Ave., Louisville 8, Ky.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland 5, O
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago 39, Ill.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh 22, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago 9, Ill.
New Haven Vibrator Co., 131 Chestnut St., New Haven 7, Conn.
Robins Conveyors, Inc., Passaic, N. J.
Royer Foundry & Machine Co., Kingston, Pa.
Simplicity Engineering Co., Durand, Mich.

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Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh 22, Pa.
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Martin Engineering Co., Kewanee, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
New Haven Vibrator Co., 131 Chestnut St., New Haven 7, Conn.
Nicholls Co., Wm. H., Richmond Hill, Long Island 18, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, .O
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Liquid Carbonic Corp., 3110 S. Kedzie Ave., Chicago 23, Ill.

WELDING ELECTRODES (Carbon)
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Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y.
International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.

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General Grinding Wheel Corp., West Abrasives, Inc., 3132 East Thompson St., Philadelphia, Pa.
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Macklin Co., Jackson, Mich.
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Norton Company, Worcester 6, Mass.
Peninsular Grinding Wheel Co., 729 Meldrum Ave., Detroit, Mich.
Safety Grinding Wheel & Machine Co., Springfield, Ohio
Simonds Abrasive Co., Tacony & Fraley Sts., Philadelphia 37, Pa.
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Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, O.

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Republic Steel Corp., Cleveland 4, O.

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Freeman Supply Co., 1152 Broadway, Toledo 5, O.
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To take charge of Inspecting, Grinding and Shipping Departments in malleable foundry. Write in detail, age, experience, when available and salary expected.

BOX 612
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Now calling on foundries and forgings companies to handle complete line of Missouri refractories. Write in detail giving territories now covered, products handled, qualifications, etc. Address: Sales Manager, Chicago Fire Brick Company, 1467 Elston Ave., Chicago 22, Ill.

GENERAL FOREMAN

A growing aluminum foundry in the "Valley of the Sun" has an opening for a working-general foreman with a thorough knowledge of nonferrous metals, and the ability to handle men. An excellent opportunity for a man who needs plenty of healthful sunshine. Give age, experience, salary desired and when available. Address: WESTERN BRONZE & FOUNDRY CORPORATION, 1810 WEST SPRUCE STREET, PHOENIX, ARIZONA.

GENERAL FOREMAN
FOR GREY IRON AND CHILLED IRON FOUNDRY

Old established concern in Chicago area wants man with practical experience in gating, rigging, core making and molding. Must be organizer and be able to get production. State age, experience in detail and salary desired. Address: Box 572, The FOUNDRY, Cleveland 13, Ohio.

PNEUMATIC TOOLS — FACTORY REPRESENTATIVES WITH SALES AND SERVICE ENGINEERING EXPERIENCE

Old established manufacturer of pneumatic tools, now with expanded line of products is desirous of obtaining Factory Representatives. Give complete record of experience. Address: Box 138, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY SUPERINTENDENT

Must be well experienced on both iron and bronze. Take full charge. Will pay salary plus liberal share of profits. Here is an opportunity for a man who knows his stuff and wants to share in the success of his efforts. Give full details of experience, education, etc. in reply. Address: Box 591, The FOUNDRY, Cleveland 13, Ohio.

WANTED
AGENTS MANUFACTURER

Of a complete line of long wearing sand and shot blast nozzles desires agents in Continental U.S., Canada and Mexico to handle sales of products. Established 8 years.

BOX 561
THE FOUNDRY CLEVELAND 13, OHIO

FOUNDRY SUPERINTENDENT

Northwestern Ohio Company. To have overall supervision of two foundries—one gray iron and one malleable foundry. Some jobbing but mostly for manufacturing division of same plant. Must be experienced in all types of foundry work. Good opportunity with substantial salary for right man. Send full statement of qualifications for interview. Address: Box 596, The FOUNDRY, Cleveland 13, Ohio.

MOLDERS

Main floor molders for Mid-west foundry. Experienced in finishing and assembling molds. Address: Box 594, The FOUNDRY, Cleveland 13, Ohio.

SHOT & GRIT
SERVICE & SALES

Midwest Shot & Grit mfr. has opening for technical or practical man who understands all operations of cleaning and blasting equipment in connection with uses of Shot & Grit to service consumers and help educate salesmen and distributors. Selling and shop background an asset. Good opportunity. Salary commensurate.

BOX 618
The FOUNDRY CLEVELAND 13, OHIO

Help Wanted

FOUNDRY SUPERINTENDENT

Well established Alabama company with all new modern equipment including continuous core ovens, mold conveyors, escalator pouring floors, continuous sand conditioning and handling systems, Wheelabrators, dust collecting systems, has opening in its foundry division for experienced Foundry Superintendent capable of assuming responsibility for mass production. Must have production foundry experience. Substantial salary, permanent position and unlimited opportunity. Living conditions desirable. We now employ 400 men. Address: Box 562, The FOUNDRY, Cleveland 13, Ohio.

BRASS FOUNDRY FOREMAN

A working foreman to assist Foundry Superintendent in a well equipped production brass foundry; good opportunity for a hustler. State age, experience and salary desired in first letter. Address: Box 192, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY FOREMAN

To take charge of Grey Iron foundry producing machinery castings, employing 50 men. Must be experienced on molding machines, cupola practice and core room. Good opportunity for a hustler. Address: Box 549, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY SUPERINTENDENT

Large nonferrous New York City foundry requires topnotch experienced superintendent. High wages but actual experience in running large aluminum and bronze foundry necessary. Address: Box 613, The FOUNDRY, Cleveland 13, Ohio.

ASSISTANT MANAGER

Either experienced foundry man or mechanical engineer business acumen. Unusual opportunity future advancement, old established concern. Address: Box 603, The FOUNDRY, Cleveland 13, Ohio.

MANUFACTURER'S REPRESENTATIVES WANTED

All important cities. Large New York foundry and machine shop, sand, permanent mold, centrifugal, pattern shop, prepared to give exclusive territories. Write in detail. Address: Box 600, The FOUNDRY, Cleveland 13, Ohio.

ASSISTANT FOUNDRY SUPERINTENDENT

In large eastern plant manufacturing products in malleable, cast iron and bronze. Should have sound metallurgical training in the production of the above metals also in sand control and be a practical foundry man. Give age, education, experience, also salary expected. Address: Box 593, The FOUNDRY, Cleveland 13, Ohio.

SALESMAN

Very large nonferrous New York foundry and machine shop, sand, permanent mold, centrifugal, pattern shop, desires high quality salesman, good contacts. Good drawing account and commissions. Write in detail. Address: Box 599, The FOUNDRY, Cleveland 13, Ohio.

WANTED IN GRAY IRON, BRASS, BRONZE AND ALUMINUM FOUNDRIES

Foundry superintendents, foundry managers, foundry foremen, core room foremen, shipping clerks. With large companies. Address: Box 619, The FOUNDRY, Cleveland 13, Ohio.

FOREMAN

Experienced malleable foreman for medium and heavy rollover work for Eastern Section. Address: Box 592, The FOUNDRY, Cleveland 13, Ohio.

GRAY IRON FOUNDRY FOREMAN

Capable of taking complete charge of jobbing foundry on castings from 1 lb. to 5 tons. Must be a practical foundryman and know cupola, rigging and able to handle men. Real opportunity for a qualified man. State experience, age and salary range. Location on East Coast. Address: Box 622, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY FOREMAN

Production gray iron foundry in Middlewest is seeking experienced molding foreman familiar with line operation and capable of controlling scrap. Good salary, bonus and chances for advancement. Address: Box 627, The FOUNDRY, Cleveland 13, Ohio.

Classified Advertising

Help Wanted

MOLD DESIGNER

Want services of an aluminum permanent mold designer to furnish design that can be made in our tool shop. Address: Box 634, The FOUNDRY, Cleveland 13, Ohio.

ALUMINUM OPEN HEARTH OPERATOR

Secondary nonferrous refiners. Midwestern Region. State experience, qualifications, references and wages desired in first letter. Address: Box 307, The FOUNDRY, Cleveland 13, Ohio.

BRASS OPEN HEARTH OPERATOR

Secondary nonferrous refiners. Midwestern Region. State experience, qualifications, references and wages desired in first letter. Address: Box 306, The FOUNDRY, Cleveland 13, Ohio.

GRAY IRON FOUNDRY

Wants all-round foundryman—practical knowledge green sand and dry sand molding. Middle West. Give full details of education, former employers and approximate salary range. Address: Box 573, The FOUNDRY, Cleveland 13, Ohio.

EXPERIENCED PATTERN MAKER

For brass foundry located in Western Michigan. One acquainted with plumbers brass work. Give references and wages desired in first letter. Address: Box 625, The FOUNDRY, Cleveland 13, Ohio.

CUPOLA FOREMAN

Experienced cupola foreman with metallurgical and laboratory background to take complete charge of iron melting for a large production foundry in the midwest. State education, age and past experience. Address: Box 637, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY FOREMAN

Experienced iron foundry foreman for a highly mechanized iron foundry for continuous pouring. State education, age and past experience. Address: Box 638, The FOUNDRY, Cleveland 13, Ohio.

Positions Wanted

MANAGEMENT EXPERIENCE

Twenty years' valuable management experience soon available. Have had full charge of engineering, sales, production, general management. Specialized in malleable and light gray iron, also fair knowledge other metals. Now returning from extended vacation and anxious to get back in harness. Address: Box 624, The FOUNDRY, Cleveland 13, Ohio.

ATTENTION MANUFACTURERS

Government Sales Representative with offices in Washington, D. C. and with products on General Schedule of Supplies is desirous of adding another item to his line. Sales record and background will stand rigid investigation. Address: Box 554, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY MANAGER

Capable, progressive gray iron foundryman with successful record as Foundry Superintendent qualified to manage and direct all foundry activities. Twenty-eight years' practical experience and technical knowledge, producing heavy machinery and diesel engine castings with proven ability developing and applying modern methods and scientific controls over all operations. Address: Box 566, The FOUNDRY, Cleveland 13, Ohio.

SUPERINTENDENT OR EXECUTIVE ASSISTANT

Age 45, college, practical and expertly trained in modern mass production. Fourteen years' superintendent grey iron mechanized foundries and related departments. Qualified in Industrial and Methods Engineering, standard practices and quality control. Capable of assuming complete supervision and maintaining healthy personnel relations for management. Excellent follow thru man for operating executive. Employed, desire broader field of activity. Address: Box 630, The FOUNDRY, Cleveland 13, Ohio.

SALESMAN

With following wants connection with foundry interested in selling white iron. Have complete information on manufacture. Address: Box 623, The FOUNDRY, Cleveland 13, Ohio.

Positions Wanted

GENERAL MANAGER
MATURE, CAPABLE, DEPENDABLE

With a record that assures you that he can manage your business energetically and safely and develop its possibilities fully and profitably. Excellent experience foundry, machinery and allied lines. General management established medium-size business primary objective. Correspondence in confidence. Address: Box 598, The FOUNDRY, Cleveland 13, Ohio.

EXPERT IN STEEL METALLURGY

Polish citizen, age 39, intending to reside in United States as from July and apply for naturalization papers seeks responsible position with prominent foundry firm. Author of book and papers on foundry work and metallurgy and holder of several patents. High references available. Would also consider partnership as foundry consulting engineer. Address: Box 556, The FOUNDRY, Cleveland 13, Ohio.

PRACTICAL FOUNDRYMAN

With many years' experience in Gray Iron, Semi-Steel, Alloys and Meehanite asks—are you having any trouble with sand control, mixtures, cupola practice, etc. I am available for whatever period of time is necessary to correct the trouble. Reasonable terms. Address: Box 568, The FOUNDRY, Cleveland 13, Ohio.

METALLURGICAL CHEMIST

Eight years as chemist and metallurgist, cast iron, steel and malleable. Chief chemist production of nickel alloys. Six years' research with major corporation; paints, lubricants, foundry sands, electroplating. Experienced in foundry casts and plant supervision. Chemical engineering training, good health, age 35. Located on West Coast. Desire responsible position with progressive firm. Address: Box 611, The FOUNDRY, Cleveland 13, Ohio.

FOREMAN
OR
ASSISTANT

Experienced in core making, squeeze molding, pouring, grinding, sand blasting, chipping and inspection work on gray iron light and medium work. Prefer Central Michigan, Northern Indiana or Illinois. Address: Box 608, The FOUNDRY, Cleveland 13, Ohio.

CORE ROOM FOREMAN

Twenty years' experience in producing cores for light and medium gray iron and meehanite castings. Plenty of experience in piece price setting. Have had only two employers the past 20 years. Best of references on request. Address: Box 607, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY FOREMAN
or
SUPERINTENDENT

Brass, aluminum or steel. Practical coremaker, molder and melter. Good rigger and get along well with all types of labor. Address: Box 586, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY EXECUTIVE

Available now. Mechanical Engineer. Age 54. Thirty years' general supervisory experience, gray iron, brass and bronze. Several locations. Familiar with men, materials, methods, machines. Aggressive, dependable, married, good references. Address: Box 606, The FOUNDRY, Cleveland 13, Ohio.

BRASS FOUNDRY FOREMAN

Capable man 33 years old. Eleven years' experience in dry and green sand. Foreman on pattern making and foundry. Experience with yellow brass, bronze, aluminum and manganese bronze. Address: Box 507, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY MANAGER OR SUPERINTENDENT

McLain Graduate of Milwaukee. Practical foundryman with many years' experience in Gray Iron Cupola or Electric Furnace and nonferrous metals—light, medium and heavy castings. Understand foundry from molding, core room, grinding room to shipping room. A-1 foundryman. Age 44 with best references. Employed as foundry superintendent. Address: Box 339, The FOUNDRY, Cleveland 13, Ohio.

Positions Wanted

STEEL FOUNDRY MANAGER

Now employed in that capacity and with unusually fine record is seeking a change. College graduate with 24 years' experience. Address: Box 604, The FOUNDRY, Cleveland 13, Ohio.

ACID ELECTRIC STEEL MELTER

Twenty-five years' experience on carbon and alloy steels. Qualified to take complete charge of melting, ladles and pouring. Available at once. Best of references. Address: Box 610, The FOUNDRY, Cleveland 13, Ohio.

GRAY IRON FOUNDRY SUPERINTENDENT

Young aggressive gray iron foundryman. Practical experience in all phases of foundry operation. Employed as foundry superintendent for past seven years. Available May 15th. Thirty-six years of age—married. Address: Box 614, The FOUNDRY, Cleveland 13, Ohio.

SUPERINTENDENT
OR
ASSISTANT

Foundryman with eighteen years' experience as metallurgist, foreman and troubleman in automotive, gray iron and malleable foundries, desires to make change. College and technical training, best of references. Position desired in Northern Ohio or Michigan. Address: Box 584, The FOUNDRY, Cleveland 13, Ohio.

SUPERINTENDENT OR FOUNDRY METALLURGIST

B.S. Metallurgical Engineer presently employed as Foundry Metallurgist and technical advisor in steel, gray iron, brass, bronze and aluminum foundry wants responsible position with progressive company desiring technical control and supervision. Experienced in all phases of casting manufacture. Address: Box 640, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY FOREMAN
OR
SUPERINTENDENT

Wants charge of gray iron jobbing shop. Practical experience on green dry sand light and heavy castings. Cupola practice. Sixteen years as foundry foreman. Address: Box 397, The FOUNDRY, Cleveland 13, Ohio.

SALES ENGINEER

Practical Foundryman, age 45, experienced sales and service, desires connection with equipment, supply manufacturer or distributor. Salary and commission basis. Industrial, mechanical engineering and metallurgical education. Know modern foundry equipment and practice from planning stage to finished casting. Location open. Address: Box 631, The FOUNDRY, Cleveland 13, Ohio.

GRAY IRON FOUNDRY EXECUTIVE AVAILABLE

Thirty years' experience in all phases of foundry operation and policy and production of light and medium weight castings. Former owner and operator of medium sized foundry in middle west. Steady, reliable, excellent background. Desire permanent connection. Address: Box 632, The FOUNDRY, Cleveland 13, Ohio.

EXECUTIVE OR ASSISTANT

Available soon. Desires connection with medium or large foundry and machine shop. Engineering and management education. 15 years working and managerial experience. Working knowledge of production management—all phases, precision dimensional control, foundry and patterns, machine tools, coordination, methods, plant layout, time study, costs and controls. Address: Box 633, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY SUPERINTENDENT

Fully experienced in nonferrous metals—light, medium and heavy castings. Cores and core room work. Twenty-five years' experience. Age 45, neat and aggressive. Employed, married.

BOX 628
The FOUNDRY CLEVELAND 13, OHIO

GENERAL FOREMAN OR SUPERINTENDENT

A practically trained foundryman, well versed in all phases of production and jobbing work, steel and high alloy. Twelve years' experience with both small and large castings. Presently employed as superintendent by Midwest Manufacturer but desire to make a change. An engineering graduate, capable of handling any foundry assignment. Address: Box 629, The FOUNDRY, Cleveland 13, Ohio.

Classified Advertising

Positions Wanted

PRODUCTION SUPERINTENDENT
OR
DIRECTOR RESEARCH

Graduate metallurgist. Twenty-five years' experience production and research in ferrous, nonferrous and cast iron field from actual manufacture of ingots to finished product. Well versed in latest technique molding, sand control and in all furnace operation. Wide knowledge of both static and centrifugal castings. Prefer East. Address: Box 576, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY ENGINEER

Diversified experience in gray iron and steel. Outstanding record of accomplishment trouble shooting on production. Skilled in foundry layout, plant design and mechanization. Well versed on scientific melting and mixing. Address: Box 571, The FOUNDRY, Cleveland 13, Ohio.

FOUNDRY EXECUTIVE

Thoroughly qualified practical grey iron foundryman with successful record as plant manager. Have nineteen and a half years' experience in production work plus three years of foundry engineering. Desire to make connection with an organization who would appreciate one who is a go-getter and can operate a plant on a well organized and solid basis. Forty-two years of age and now employed. Address: Box 636, The FOUNDRY, Cleveland 13, Ohio.

Correspondence Course

THE CUPOLA IS THE HEART OF THE FOUNDRY

Turn the searchlight of McLain's System on your cupola. 90c of every dollar is spent before melting begins—but some make it look like 30c by indifferent melting. Are you using the maximum percentage of steel scrap in your castings? If not, why not? The value of the scrap pile lies in the fact it offers you food for thought. Our system is worth the fee as a desk reference. Synopsis free.

McLAIN'S SYSTEM INC.
236 E. NORTH AVE., MILWAUKEE 12, WIS.

Accounts Wanted

ACCOUNTS WANTED

Sales Engineers calling on industrial trade in New York-New Jersey territory desire casting and machine work account. Exclusive representation. Commission basis.

JOSEPH C. ZOLL
CHAMBER OF COMMERCE BUILDING
NEWARK, N. J.

Open Capacity

AVAILABLE CAPACITY

Open capacity on both vertical and horizontal centrifugal casting machines. Aluminum bronze and nonferrous alloys. Deliveries immediately. Send us samples or prints for quotations.

MILWAUKEE BRONZE CASTING COMPANY

145 SOUTH FIRST STREET

MILWAUKEE 4, WIS.

Wanted-To-Buy

WANTED

Tabor Jar Squeezer, Cantilever type or equivalent. Size 18" x 20" or 24" table.
Jar Ram—Hand roll over—Pattern draw 20 x 22 table or comparable.
250-300 C F Horizontal Motor driven air compressor 90 to 100 lb. pressure.

MASCOT STOVE CO.
CHATTANOOGA 2, TENN.

Wanted-To-Buy

GOOD USED FOUNDRY EQUIPMENT
WANTED IMMEDIATELY

80—sets 26" round tight flasks with or without bars. 8" drag and 12" cope. Will consider 24" square flasks.
4—6000-lb. bottom pour ladles with any available stopper rods, nozzles, stoppers and other accessories. Will purchase available refractories for steel.
1—Jolt—squeeze—rollover—draw machine for 28" flask with 10" draw. Prefer 20" or over squeeze piston.
1—Jolt—squeeze—pin or frame left cope machine to pair with above.
30" heavy duty gravity roll conveyor. (need four 90° turns) Specify lengths and number of turns available.

GUNITE FOUNDRIES CORPORATION
ROCKFORD, ILLINOIS

WANTED

One No. 300 Fisher Furnace for Brass or similar—oil fired. Wire: CENTRAL BRASS MFG. CO., CLEVELAND, OHIO.

WANTED
FOUNDRY TO RENT

With option to buy. Large enough for ten tons of castings. In New York state or Pennsylvania. Address: Box 530, The FOUNDRY, Cleveland 13, Ohio.

WANTED

Good, used JOLT-SQUEEZE MACHINE. Comparable in size to Adams 10 x 32 Side Rod Portable or Osborn No. 276 J.
Call or write:

KELLY FOUNDRY & MACHINE CO.
ELKINS, W. VA.
PHONE 90

WANTED

Detroit Electric Rocking Furnace
3000 lbs. capacity cold melt
6000 lbs. capacity duplex
Complete with control panels and transformers.

FRANK FOUNDRIES CORP.
MOLINE, ILL.

WANTED

American Gasoline Sand Cutter same as or similar to Model AA712, size 62". Inside width of wheels, rim to rim 65", outside width 72". Overall width not more than 7' 5", cutting wheel 52". Address: **SANITARY CO. OF AMERICA, LINFIELD, PA.**

MIXERS WANTED

Used Simpson Intensive Sand Mixers. State size, condition and lowest cash price for immediate acceptance. Address Box 578, The FOUNDRY, Cleveland 13, Ohio.

WANTED
SMALL CAST IRON FOUNDRY

To buy or rent with option to buy. Located in Illinois, Wisconsin or Indiana. Address: Box 616, The FOUNDRY, Cleveland 13, Ohio.

WANTED TO BUY

Complete set of bushing patterns and plug patterns, American standard. Address: Box 531, The FOUNDRY, Cleveland 13, Ohio.

WANTED

Centrifugal casting machine for a maximum weight of mold and casting of 500 lbs. Diameter of table—30". Speeds to be variable from 75-600 RPM. Address: PARKWAY FOUNDRY & MACHINE CO., 59 PAIDGE AVE., BROOKLYN 22, N. Y.

Opportunities

EXPORT REPRESENTATION

American mfr. of quality steel cleaning and peening shot and grit wants foreign trade. Big stocks. Ask for literature and samples. Advise lines now selling, territory covering.

BOX 617
The FOUNDRY CLEVELAND 13, OHIO

Opportunities

OPPORTUNITY

We can furnish empty tight and slack wooden barrels also steel drums for your products. ADDRESS: BUCKEYE COOPERAGE STATION C.P.O. BOX 1501, CLEVELAND, OHIO.

FOUNDRIES

To handle gray iron, brass, bronze, aluminum casting. Large orders with good work and steady runs. Address: Box 620, The FOUNDRY, Cleveland 13, Ohio.

Capacity Wanted

We want to contact a foundry who is able to handle small and medium-sized castings—grey cast iron. Our patterns are of the most modern type; aluminum match plates and smaller patterns are several to a board. Steady reorders. Initial order, 30 ton-reorder every four months or sooner.

HARVEY MFG. CORP.
161 GRAND ST.
NEW YORK 13, N. Y.

WANTED

Foundry to make small gray iron castings. Can give contract for 350 to 500 ton first year. Pattern plates furnished. Address: C. G. S., P. O. Box 31, Oconto, Wis.

Foundries For Sale

LARGE FOUNDRY

BESSEMER, ALABAMA
(12 miles West of Birmingham)

Over 100,000 sq. ft. of buildings, located on approximately 10 acres, Southern and L&N Railroads, including equipment. Ready to go on castings, stove parts or cast iron soil pipe. Equipment includes a No. 9 and No. 10 Whiting Cupola, blowers, compressors, mono-rail, hoists, pattern shop, machine shop and various tools. Does not include patterns and flasks. The property is offered at $85,000, which is a bargain for anyone with the "Know-How". Call Elbert S. Jemison—3-5141.

JEMISON REALTY COMPANY
REALTORS
EXCLUSIVE AGENTS
BIRMINGHAM, ALABAMA
MEMBERS OF SOCIETY OF INDUSTRIAL REALTORS

FOR SALE

Gray iron jobbing foundry. Sand slinger, cranes, two cupolas, modern equipment. Light and heavy floors. Equipped to pour and handle castings up to 20 tons each. Location Northwestern Ohio. Address: Box 595, The FOUNDRY, Cleveland 13, Ohio.

FOR SALE

New well equipped foundry for gray iron brass and aluminum production. Will handle 25 moulders, on light, medium and heavy castings. Capacity 6 to 7 tons per day. Located in Maryland. Excellent transportation. Address: Box 621, The FOUNDRY, Cleveland 13, Ohio.

For Sale

FOR SALE

1—No. 4 Roots-Connersville Positive Cupola Blower in good running condition.

P. H. MAGIRL FOUNDRY & FURNACE WORKS
413 E. Oakland Ave.
Bloomington, Ill.

FOR SALE

General jobbing, vicinity of Philadelphia, Pa. Sales from $85,000 to $90,000 a year with plenty of orders. Owner wishes to retire. Address: Box 641, The FOUNDRY, Cleveland 13, Ohio.

FOR SALE

Grey Iron Foundry—Highly mechanized—doing $500,000 annual business. Top notch superintendent and thoroughly experienced workers. Near New York City. Ample room for expansion. Address: H. C. Broker, 644 Williams Ave., Brooklyn 7, N. Y.

Classified Advertising

For Sale

REBUILT EQUIPMENT IN STOCK

Molding Machines
2—International Type F 24" x 10" Stationary Power Jolt, Rollover, and 10" draw.
1—International Type F 26" x 12" Stationary Power Jolt, Rollover, and 10" draw.
1—International Type M 24" x 10" Portable Power Jolt, Hand Rollover and Draw.
1—Osborn No. 450 Stationary Jolt Stripper.
1—Osborn No. 405 Stationary Jolt Rollover with 9" draw cyls.
1—Pridmore Type V Style AV Jolt Rollover Draw 48" x 74" Table 4000 lbs. capacity.
4—Arcade Modern No. 2-38 Portable or Stationary Hand operated Squeeze Rollover Draw with swing out table.
5—Mumford 3" cyl. Core Jolt with 20" x 15" table.
Several plain air squeezers.

Metal Melting Equipment
New 32" to 41" dia. shell cupolas made to order.
1—Monarch Tilting Iron Pot Aluminum Furnace 100 lbs. cap. Gas or Oil.
2—Hausfeld Tilting Crucible Aluminum Furnaces 33" dia. shell. Gas or Oil.
2—Hausfeld Open Flame Tilting Brass Furnaces 400 lbs. cap. Gas or Oil.
2—Monarch-Rockwell Rotating 500 lbs. brass. Oil.

Blowers for Cupolas and Furnaces
1—19 Cu. Ft. per rev. Rotary Blower.
Maxon-Premix Blower Sets for Gas ⅛ to 1 H.P Motor Driven Centrifugal blowers to 2 lbs. press
Belt Driven Centrifugal blowers for Cupolas

Tumbling Mills and Sand Blast
1—McLeod 36" x 36" Sand Blast Barrel with Suction sand feed.
3—Portable Sand Blast generator tanks 500 lbs. sand capacity.
1—McLeod Sand Blast Generating Tank.
1—McLeod Cloth Screen Dust Collector.
1—Swartwout Car Type Core Oven with Insulated Steel walls, 6½' x 7' x 11' inside dimen 5' x 6½' Door. Gas Fired. One Car Included
1—4000 lbs. cap. Worm Geared Crane Ladle.
Air Compressors 1 to 60 H.P.

CLIFTON MACHINERY CO.
1023 W. 6th ST. CINCINNATI 3, OHIO
PHONE PARKWAY 7812

FOR SALE

Tumbling Mills. W. W. Sly Make. Exhaust type. Heavy duty. Friction cluch. Gear Drive. Good Condition.

3—48" by 28" x 28" square.
1—60" by 36" x 36" square.
2—Cast iron Octagon Mills 56" x 24" inside. Ball Bearings. Built 1940.
1—42" x 16" x 16" square Mill Ball Bearing.
2—Light Weight Barrels. 42" high, 26" wide for Aluminum and light work.

JAY SALTER
306 ROSEDALE STREET
ROCHESTER 7, N. Y.
MONROE 8075

FOR SALE

#1 American tablast complete with dust arrestor new piping, 220, 440V, 2 Ph, 60 cycle. 6, 15" tables or 12 8" tables many extra repair parts priced $2500—complete F.O.B. our plant. Address: HILLSDALE FOUNDRY CO., HILLSDALE, MICHIGAN.

FOR SALE

Two cupola spark and flame suppressors for #4 Whiting cupolas. Shell diameter 56". Good condition. Never used.

THE SYMINGTON GOULD CORPORATION
DEPEW, NEW YORK
A. R. McHENRY

For Sale

CENTRIFUGAL COMPRESSORS AND BLOWERS

2100 CFM GE with 10 HP 3/60/3450 RPM motor.
1200 CFM Buffalo, 9½ x 7 x 7¼ with 7½ HP, 220/3/60 1750 motor.
20¼ x 16¼ x 18¼ Allington and Curtis No. 55 (belt drive).
10½ x 10½ American size 5, (belt drive).
(2) 8 x 8 Sturtevant size 21061-9 (belt drive).

THE MOTOR REPAIR & MFG. CO.
1552 HAMILTON AVE., CLEVELAND 14, OHIO

FOR SALE

Molding Machine
49" x 84" Table
with 16" pattern draw
International Type F
Roll-over Jolt
Used only 6 months.

WAYNE FOUNDRY CO.
DETROIT 10, MICH.
TEL. LAFAYETTE 8226

FOR SALE

Pangborn Cleaning Units (Shot Blast), Type ES-141 Wheels, Conveyor, Separator, Buckets, Rotoblast Unit. Motor driven Scalping Wheel and Motors like new. Metal Wash Unit never used. Address: H. Loeb & Son, 4643 Lancaster Ave., Philadelphia 31, Pa.

FOR SALE

One new Lindberg Electric production type magnesium heat treating furnace complete. Address: Box 570, The FOUNDRY, Cleveland 13, Ohio.

FOR SALE

One #3 Simpson Sand Muller complete with motor—9 ft. pan. Excellent condition. Address: Taft Alloy Steel Company, Taft, California.

EQUIPMENT AVAILABLE FOR SALE

1—Motive type Sandslinger, D.P.C. A-208.
1—Two ton Monorail Hoist, 440, 3 phase, 60 Hoist, 220 volts, D.C. cycle, D.P.C. A-212.
1—One ton Monorail Hoist, 440, 3 phase, 60 cycle, D.P.C. A-216.
1—Three ton Monorail Hoist, 440, 3 phase, 60 cycle, A. A-216.
1—Five ton American Engineering Monorail
1—Double unit fired temp. controlled, car type cover oven, D.P.C. A-203.
4—Trucks for above oven, D.P.C. A-203.
1—Hough Front Loader (H.S. shovel), D.P.C. A-213.
1—Stiff Leg Derrick (16" leg), D.P.C. A-204.
1—#4 Whiting cupola, D.P.C. A-212.
2—One ton converters, D.P.C. A-212.
1—15' 4" span crane, D.P.C. A-212.
1—Hand powered Whiting Crane, D.P.C. A-215.
5—Modern, trolley Monorail Cranes; crane way and power duct, D.P.C. A-216.
1—Fifteen ton Toledo scale model 5941, D.P.C. A-217.
1—Sundstrand stub lathe, D.P.C. A-220.
1—24" Gisholt turret lathe, D.P.C. A-222.
1—#2 Simpson Intensive Mixer.
Complete stock of spare parts for American model "AH" Sandcutter.
1—Double ended disc grinder.
2—Drill presses.
1—15 HP 1800 r.p.m. 440/220 vertical motor; frame #J. L.-8-F., Fairbanks Morse.
1—40 HP 1800 r.p.m. 440 vertical motor, Fairbanks Morse, frame #J-12-B, Type U.H.A.
1—40 HP 860 r.p.m. 440/222 General Electric, serial #1767999, Frame #KT336.
1—15 HP 1800 r.p.m. Fairbanks Morse motor, 440 volts.
1—20 HP 685 r.p.m. 440, American Electric, serial #8953.
2—300 amp, type FK, oil circuit breakers.
1—3 HP 1220, 440, J type H, frame #H-G-B, Fairbanks Morse, serial #118217.
1—#41 C. H. Besley Co., double disc grinder on 7½ HP, 1145 r.p.m., 3 phase, 440 volt, 60 cycle, General Electric motor, Model #49833.
2—12" W. F. & John Barnes drill presses.
1—Standard Machine Company #4 drop hammer.
1—18" plain bearing grinder stand.
1—5 HP, 900 r.p.m. variable speed motor, 440, 3 phase, 60 cycle.
1—15 HP, 900 r.p.m., open type motor.

BOX 626
The FOUNDRY CLEVELAND 13, OHIO

For Sale

OVERHEAD ELECTRIC TRAVELING CRANES

	Tons	Make	Span	Current
(1)	5	Northern	30'9"	220-VAC.
(1)	5	P & H	35'0"	220-VAC.
(1)	8	Toledo	51'6"	230-VDC.
(2)	10	P & H	35'0"	230-VDC.
(2)	10/5	P & H	80'0"	230-VDC.
(2)	10	P & H	80'0"	230-VDC.

(1—10-ton & 1—5-ton trolleys on each cranes)

(1)	20	Cleveland	50'0"	230-VDC.
(1)	30/10	Whiting	80'0"	230-VDC.

(1)—15-ton Shaw 106'8" span, 230-VDC., CG. OP. 36' lift, will furnish REBUILT for outdoor or indoor service.
(1)—3-ton Chesapeake Gantry, 3-motor, CG. OP., or FL. OP. 220/440-VAC. 18'11" between legs, 5'6" overhang each end.
Add to McCABE ADD .. ..

MONORAIL ELECTRIC HOISTS

	Tons	Make	Current	Remarks
1	½	Lo-Hed	220-VAC.	Fl. Op.
3	½	Shepard	230-VDC.	2-motors
1	1	Harrington	A.C. or D.C.	Fl. Op.
1	1	Euclid	110-VDC.	Fl. Op.
4	1	Shepard	230-VDC.	Fl. Op.
1	2	Link-Belt	220-VAC.	Geared Troll.
2	2	Shepard	110-VDC.	Fl. Op.
1	2	Shepard	230-VDC.	Fl. Op.
1	3	Shepard	230-VDC.	Geared Troll.
1	5	Shepard	230-VDC.	2-motors
1	7½	Shepard	230-VDC.	2-motors

(Cg. Op. 40'0" Lift, Hoist 25/75-FPM., trolley 400-FPM.)

230-VDC. CRANE & MILL MOTORS				SERIES R.P.M.
H.P.		Make	Type	
1	2½	G.E.	C.O.-1803 (Comp.)	650
1	5	Westghse	HK-2	850
1	6	G.E.	C.O.-1805	1150
2	6¼	Westghse	K-3	680
1	7½	Westghse	K-4	750
1	7½	G.E.	C.O.-1804	725
1	7/10	G.E.	MD-102 (Back Axle)	1025/800
1	9	G.E.	MD-102 (Back Axle)	975
1	12	G.E.	MD-103	875
1	15	Westghse	HK-5	700
2	15	Westghse	K-6	550
2	11/19	C.W.	B.W. (Back Axle)	675/560
2	30/45	G.E.	MD-104½ (Compd.)	625/500
1	35	G.E.	C.O. 1810	500
1	30/45	C.W.	Size D.W.	620/520
2	42½	Westghse	K-8	910
1	50	G.E.	MD-105	475
2	52	Westghse	K-10 (Back Axle)	740
2	54/80	C.W.	Size F.W.	575/480
1	150	Westghse	RNY-96 (Comp.)	550

Send for our stock list covering 230-VDC. single and variable speed motors, 220/440-VAC. std. and slip ring motors, crane controllers and electric brakes. 1 to 1200-HP. M.G. Sets, etc.

SPECIAL:
1—3-ton Chesapeake 3-motor, Cg. Op., 220/440-VAC. Gantry Crane, 18'11" bet. legs, 15'6" overhang each end, REBUILT.

WE OWN AND HAVE ALL THIS EQUIPMENT IN STOCK. IT IS OFFERED REBUILT IN OUR LARGE, MODERN PLANT AND FULLY GUARANTEED.

T. B. MACCABE CO.
4304 CLARISSA ST.
PHILADELPHIA 40, PA.

FOR SALE

1—Whiting No. 10 cupola, serial No. 4893, complete with stack, water jackets, wishbone and three charging buckets, size 48" diameter x 48" high.
1—Three-ton No. 3894 Whiting charging trolley.
1—Allis-Chalmers 4" x 3" SK water pump with 20 HP type ARX motor.

NATIONAL MALLEABLE AND STEEL CASTINGS CO.
546 NORTH HOLMES AVE.
INDIANAPOLIS 6, IND.

FOR SALE

1—Detroit electric furnace, type LF, 350 to 500 lbs. capacity, brass or equal; has practically new basic lining, box of electrodes, complete electrical equipment including 440 volt, single phase primary transformer, oil switch, instruments, bus copper and cables, excellent condition, ready to run. Price $3450.00 f.o.b. Cleveland, Ohio.

BOX 615
The FOUNDRY CLEVELAND 13, OHIO

Classified Advertising

For Sale

OVERHEAD CRANES

200 Ton Alliance 100′ Span
175 Ton Morgan 54′ Span
150 Ton Whiting 30′ Span
80 Ton "American" 40′6" Span
75 Ton Alliance 37′ Span
75 Ton Alliance 78′ Span
50 Ton Cleveland 71′10⅛" Span
50 Ton Shaw 69′10" Span
40 Ton Alliance 82′ Span
35 Ton Northern 22′ Span
30 Ton Case 41′ Span
30 Ton Morgan 30′ Span
30 Ton Morgan 77′ Span
30 Ton Niles 53′9" Span
30 Ton P&H 80′ Span
30 Ton Reading 56′ Span
25 Ton Bedford 50′ Span
25 Ton Cleveland 106′ Span
25 Ton P&H 70′ Span
25 Ton Whiting 106′ Span
25 Ton Whiting 82′ Span
25 Ton Whiting 56′ Span
20 Ton Alliance 77′ Span
20 Ton Cleveland 65′ Span
20 Ton Morgan 77′ Span
20 Ton Northern 60′ Span
20 Ton P&H 39′6" Span
20 Ton P&H 51′4" Span
20 Ton Shaw 76′4" Span
20 Ton Shepard Niles 49′6" Span
20 Ton Shaw 76′4" Span
15 Ton Alliance 50′ Span
15 Ton Alliance 35′ Span
15 Ton Cleveland 55′6" Span
15 Ton Cleveland 35′ Span
15 Ton Morgan 77′ Span
15 Ton Niles 32′ Span
15 Ton Northern 53′ Span
15 Ton Shaw 82′ Span
15 Ton Shaw 77′ Span
15 Ton Toledo 82′ Span
15 Ton Whiting 74′8½" Span
15 Ton Whiting 71′10½" Span
12 Ton Morgan 56′ Span
10 Ton Alliance 58′9" Span
10 Ton Alliance 71′10" Span
10 Ton "American" 27′ Span
10 Ton Cleveland 38′ Span
10 Ton Cleveland 50′ Span
10 Ton Emsco 30′ Span
10 Ton Lane 50′ Span
10 Ton Morgan 39′5" Span
10 Ton Morgan 77′ Span
10 Ton P&H 57′ Span
10 Ton P&H 78′ Span
10 Ton P&H 87′6" Span
10 Ton Northern 34′ Span
10 Ton P&H 48′10½" Span
10 Ton P&H 60′ Span
10 Ton P&H 80′ Span
10 Ton Shaw 68′ Span
10 Ton Shaw 58′ Span
10 Ton Shaw 88′ Span
10 Ton Northern 71′10½" Span
7½ Ton Erie 70′ Span
7½ Ton P&H 30′6" Span
7½ Ton Scullin 71′10½" Span
7½ Ton Shepard 36′ Span
6 Ton Shaw 23′ Span
5 Ton "American" 10′ Span
5 Ton Champion 37′6" Span
5 Ton Euclid
5 Ton Milwaukee 39′8" Span
5 Ton Milwaukee 66′9" Span
5 Ton Milwaukee 70′ Span
5 Ton Northern 49′6" Span
5 Ton P&H 45′ Span
5 Ton Shaw-Box 25′ Span
5 Ton Shepard 40′ Span
5 Ton Toledo 96′ Span
5 Ton Whiting 80′ Span
3 Ton P&H 46′4" Span
3 Ton Shaw 33′ Span
3 Ton Whiting 57′3" Span
2 Ton Detroit 28′ Span
2 Ton P&H 46′4" Span
2 Ton Shepard-Niles 18′&14′
1½ Ton Cleveland 25′ Span
1½ Ton P&H 34′ Span
1 Ton Curtis 24′ Span

Take advantage of the ECONOMY service by telephoning to us collect, which will enable us to discuss your requirements and present our suggestions.

In addition to overhead cranes we can supply all types of shovels, cranes, draglines, tractors or practically everything in the equipment field. May we have your inquiries?

ECONOMY CO., INC.

49 VANDERBILT AVENUE, NEW YORK 17, N. Y.

Telephones: MUrrayhill 4-2294, 4-2893, 4-2295, 4-2844, 4-2296, 4-8292

FOR SALE

1—Pangborn Sand Blast Room 8½′x10" Type NB, size 34, Serial #142212, equipped with new abrasive chute, from room wall to elevator boot, new bucket elevator, new abrasive separator, helmet, regulator, release valve, air gauge and cut-off cock, with Pangborn Dust Cloth Collector, with Type F, size 7 Exhauster No. 9200, approximately 9000 CFM, equipped with GE Induction Motor, 220V, 60C, 3 Phase, AC, 15 HP, 1160 FLRPM. Price $3,000.

THE EASTERN FOUNDRY COMPANY
BOYERTOWN, PA.

FOR SALE

1—Beardsley Piper Sandslinger, stationary type, double belt, 19" head, 4" tip, 7-10 C.F.M. ramming capacity, first arm 8", second arm 4", ramming motor 20 H.P. 1200 R.P.M., 220 V., 60 cycle, total 22½ H.P.
1—Beardsley Piper SC-55 gyratory screen portable sand conditioner with magnetic pulley. 3 H.P. screen motor, 5 H.P. sandarator and belt motor, 220 V., 60 cycle, 3/4 K.W.D.C. generator for magnetic pulley.

Both machines slightly used, in excellent condition and can be shipped immediately.

GREEN COLONIAL FURNACE COMPANY
DES MOINES 7, IOWA

FOR SALE

1—30′ span Euclid single 12" I-beam geared floor operated traveling bridge crane with plain bridge beam—4 wheel trolley. Condition exceptionally good. Address: G. & C. Foundry Co., Sandusky, Ohio.

FOR SALE

One Sly Tumbling Mill 48" x 72" with 1½" Shell, complete with stand and drive shaft, used only three months, in good condition.

COLUMBIANA FOUNDRY CO.
COLUMBIANA, OHIO

FOR SALE

1—Ransohoff Water Mill 36 x 60 side loading and end loading. Automatic star separation and star return. Complete with direct drive and in good condition.
1—International Jolt Strip—power draw 20" x 26" x 8 J.W.P. Serial 19081.
3—Osborn Jolt Squeezers—275-J; 10" squeezer cylinder; 3" jolt cylinder 16 x 20 table.
1—Plain jolt machine 20 x 30 table.
1—Cylindrical-covered ladle (geared) 29" x 28½" (Modern) 1500# capacity.
1—Model 404 Clearfield Muller (4 cu. ft. capacity) 158-C; Serial 5549-B.
1—405 Osborn Jolt Roll-over pattern draw; jolt cylinder 12" dia. Pattern draw 18" max flask limit 64".
1—Osborn #275JW Jolt Squeeze; Serial 8032-0.
1—Demmler Core blow machine; Model #1.
1—Osborn Core roll-over jolt; model #140J.
2—Tumbling Barrels; 22" dia., 28" inside length.

Can be inspected at our plant.

BOX 635
The FOUNDRY CLEVELAND 13, OHIO

REBUILT EQUIPMENT

Molding machines, all types; tumbling mills; furnaces; cupolas; air compressors; hoists; rammers, all types; ladles, all types; sand mixers; sand blast tanks; core machines, etc. All equipment rebuilt and guaranteed. All sizes used steel flasks.

HAYNES FOUNDRY EQUIPMENT COMPANY
1734 LAKE ST. KALAMAZOO 21, MICH.

FOR SALE

1—Johnston & Jennings No. 918, Jolt Roll-Over Pattern Draw Moulding Machine, Table 44" x 54", Draw 18". Excellent Condition. Address: T. B. WOOD'S SONS COMPANY, 1200 FIFTH AVENUE, CHAMBERSBURG, PA.

FOR SALE

37,000 pounds
3 inch CORE WIRE
New 19 Gauge Steel
Write, wire or phone

SONKEN-GALAMBA CORP.
108 N. 2nd ST.
KANSAS CITY, KANSAS

FOR SALE

1—Used International Jolt Machine Good condition 4′ x 6′ table. Price—$600.00, F.O.B. East Chicago, Ind.

CALUMET FOUNDRY & MACHINE CO.
EAST CHICAGO, INDIANA

FOR SALE

A large organization is offering for sale a subsidiary engaged in heavy steel plate fabricating.

MARGARETTEN & COMPANY INC., AGENTS

276 HOBART STREET
PERTH AMBOY, N. J.

FOR SALE

Have surplus of 35 sets 16" x 22" Black, Sivals and Bryson steel flasks, 8" cope and drag, also 8 sets 24" x 28" sterling steel flasks, 6" cope and drag. Would sacrifice for quick move. Call or write:

ATHENS PLOW COMPANY
ATHENS, TENNESSEE

REBUILT
BLOWERS—FANS—EXHAUSTERS

Centrifugal blowers for gas and oil burning Sand blast, grinders and dust exhausters Roots-Connersville positive cupola blowers Welding fume exhausters—Ventilating fans.

GENERAL BLOWER CO.
8601 FERRIS AVE.
MORTON GROVE, ILL.

TRANSFORMER FOR SALE

1000 KVA used electric furnace transformer for sale.

BOX 601
The FOUNDRY CLEVELAND 13, OHIO

FOR SALE

A well-equipped brass and gray iron foundry. Location Northwestern Ohio. Address: Box 468, The FOUNDRY, Cleveland 13, Ohio.

FOR SALE

1 each 3 ton and 7 ton rated capacity Heroult furnaces with regulators, switchboards and substation equipment. Prices low. Address: James Jones, P. O. Box 654, Pittsburgh 30, Pa.

Employment Service

GRAY IRON FOUNDRY EMPLOYMENT

We are receiving many inquiries for superintendents, metallurgists and foremen. We shall be glad to hear from qualified men. No charge

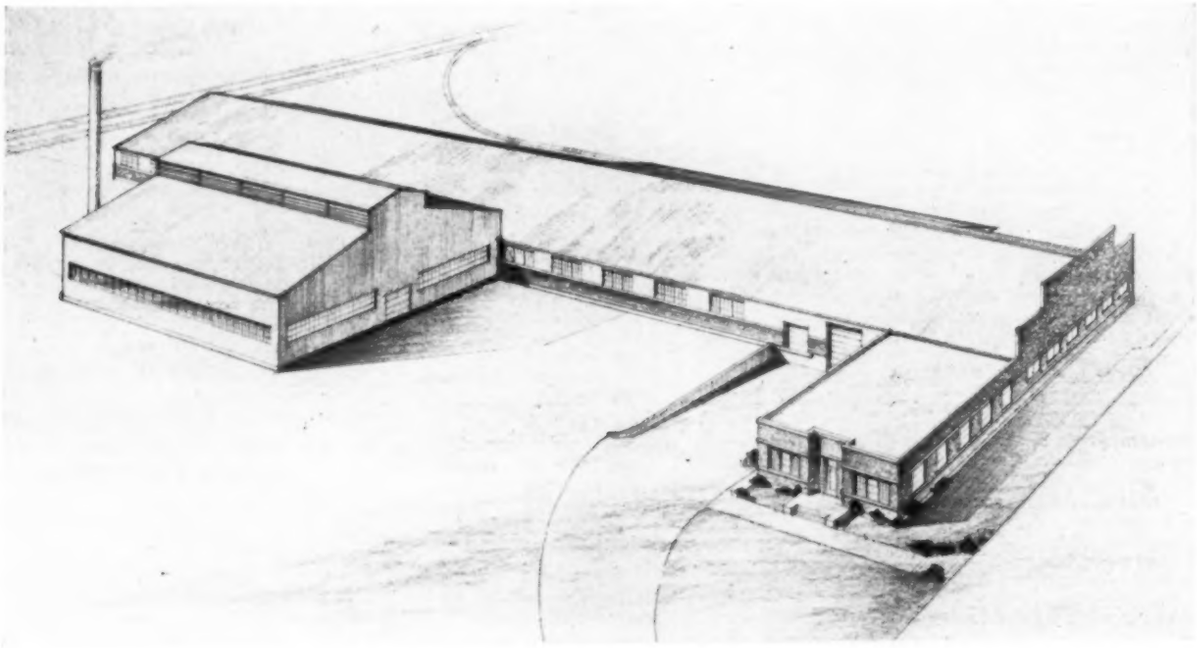
Gray Iron Founders' Society Inc.
1010 Public Square Building Cleveland, Ohio

SALARIED POSITIONS
$2,500-$25,000

This thoroughly organized confidential service of 36 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
101 Dun Bldg. Buffalo 2, N. Y.

THANK YOU MR. FOUNDRYMAN—
for making this NEW PLANT *possible*



We are pleased to announce the opening of our new plant at 4391 Bradley Road. Your wide acceptance and steadily increasing use of Schumann Brass and Bronze Ingots made it necessary to build this new plant and substantially increase our production capacity.

An invitation is extended you to visit us at our new plant now open for inspection . . . Our Convention Headquarters will be at the Hotel Hollenden.

I. SCHUMANN & CO.

Smelters and Refiners

CLEVELAND, OHIO

Schumann INGOTS *for careful foundrymen*

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MODERNIZE WITH PARSONS DUST ARRESTORS

Parsons Oval Bag Dust Arrestors Actually Pay For Themselves

Don't wait! Make your plans today! Post-war competition will be keen, with demands for greater production and working conditions that take into consideration the health of your employees. Foundry dirt and dust deteriorate equipment, slow up production . . . decrease employee efficiency and cause absenteeism. Dirt and dust is an extremely costly element which can definitely be eliminated by Parsons Oval Bag Dust Arrestors. The remarkable improvement in the health, energy and efficiency of employees plus the added production of both men and machinery will prove conclusively that Parsons Oval Bag Dust Arrestors actually pay for themselves. Let our engineers show you foundry installations from coast to coast. Without obligation let us check into your dust problem.

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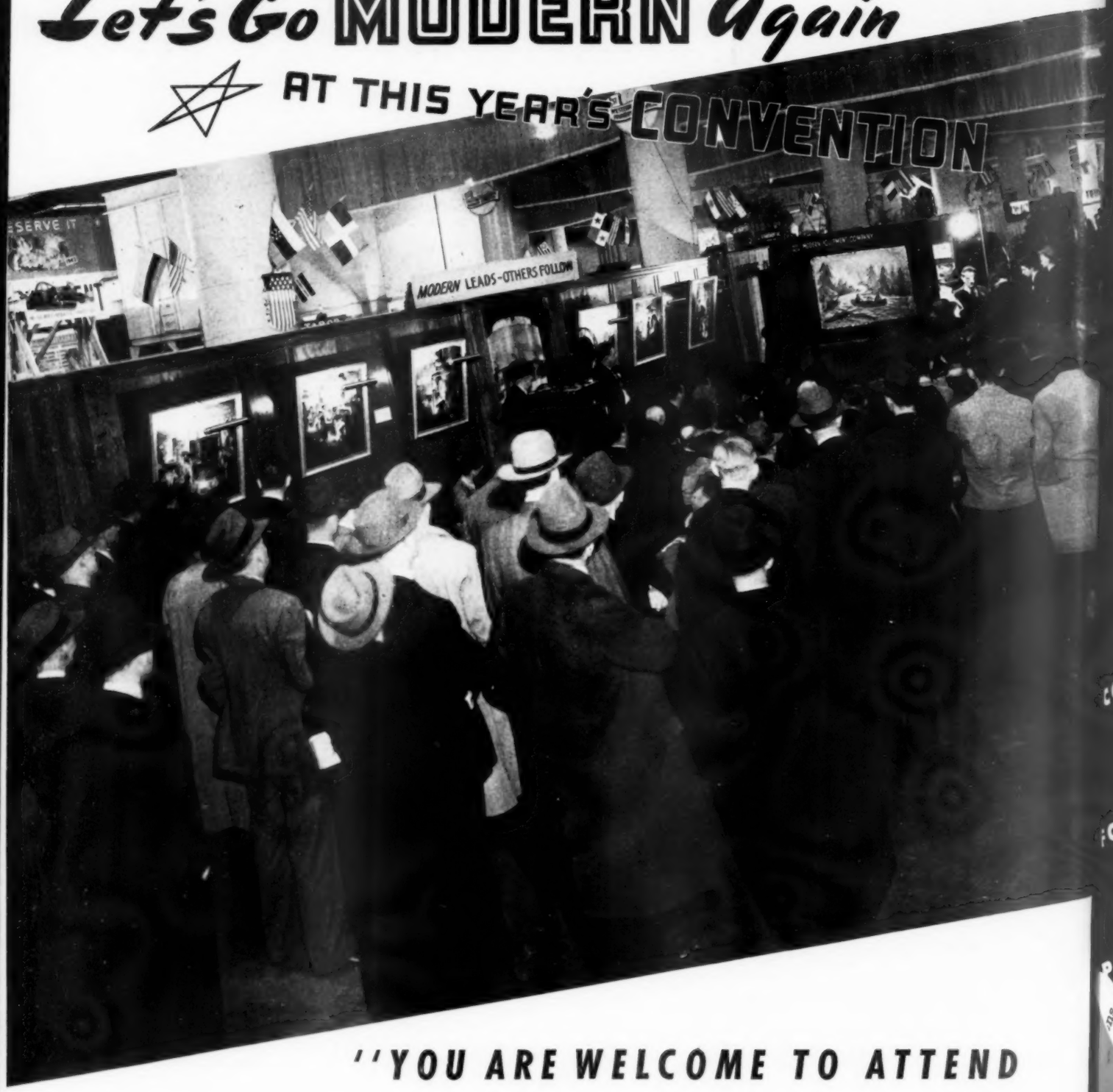

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The New LINK-BELT Oscillating-Trough Conveyor Cuts Maintenance in Foundry Service

Left: Squeezer molds made in snap flasks, are automatically discharged after being poured and sufficiently cooled, from two Link-Belt mold conveyors to the oscillating conveyors shown. These conveyors handle the hot sand and castings at a speed of about 40 F.P.M. and convey them to a central Link-Belt shakeout screen. Each of these conveyors has a capacity of 75 tons of sand and castings per hour. The power consumed is less than for an apron conveyor.

Below: Poured molds being dumped to a 36″ wide Link-Belt oscillating conveyor in tunnel below floor at Gunite Foundries Corp., Rockford, Ill. This conveyor takes the hot sand and castings to the shakeout.

Check These Advantages

√ 1. Molds can be discharged to this conveyor from several points at once. Action of the conveyor levels off sand and castings—no spillage occurs.

√ 2. Hot sand, castings, metal particles, core wires and gaggers can't burn out or injure its steel conveyor trough.

√ 3. Greatly reduced maintenance as compared with other methods of handling these abrasive materials.

√ 4. No return runs required.

√ 5. Can be installed in any length, simply by the addition of sections.

√ 6. Can be built to handle capacities in a wide range, by varying the widths and depths of troughs.

√ 7. No "joints" to be attacked by abrasion; hence much less maintenance.

√ 8. There are no parts moving in respect to each other, except the drive; hence no lubrication necessary except at this point.

√ 9. Section of the conveyor can be set at angles with transfer from one to the other involving only an 8″ drop. This gentle handling protects castings.

√ 10. Power requirements are remarkably low.

LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities. 10,307

SEE OUR EXHIBIT—A.F.A. CONVENTION—CLEVELAND, MAY 6-10.

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